

HISTORICAL ILLUSTRATED VOLUME.

TIMEHRI:



THE JOURNAL

OF

The Royal Agricultural and Commercial Society
OF
British Guiana.

VOL. V. Third Series.] AUGUST, 1918. Historical Illustrated Volume.

HON. J. J. NUNAN, K.C., LL.D., *Editor.*

JAMES RODWAY, F.L.S., *Assistant Editor.*

To Our Readers.

The circulation of TIMEHRI outside the limits of the Colony is now so large that it may be as well to explain that the title of the magazine was taken by its original founders from the Indian name of the ancient and so far undecipherable picture writing found on the rocks of the Guiana Rivers.

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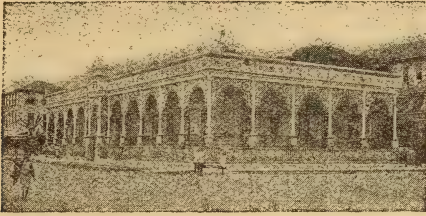
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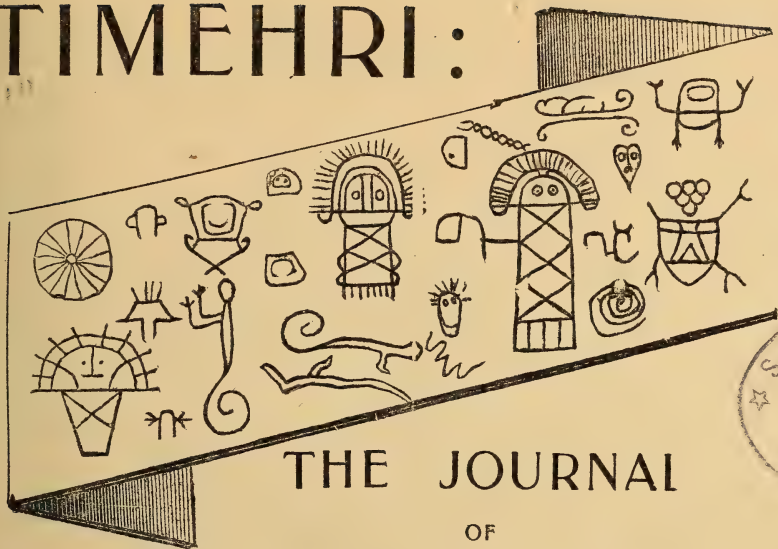
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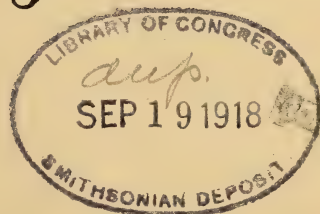
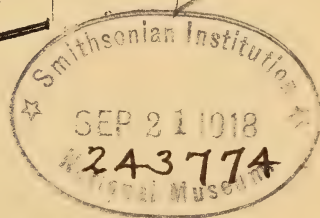
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HON. J. J. NUNAN, K.C., LL.D., *Editor.*

JAMES RODWAY, F.L.S., *Assistant Editor.*

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THE ROYAL AGRICULTURAL AND COMMERCIAL SOCIETY
OF BRITISH GUIANA.

VOL. V.

AUGUST, 1918.

HISTORICAL
ILLUSTRATED VOLUME.

INTRODUCTION.

LOSS AND GAIN.

"Under the British flag wherever he journeyed, he found men of English speech living in an atmosphere of liberty and carrying on the dear domestic traditions of the British Isles. He saw justice firmly planted there, industry and invention hard at work unfettered by tyrants of any kind, domestic life prospering in natural conditions and our old English kindness and cheerfulness and broad-minded tolerance keeping things together. But he also saw room under that same flag, ample room for millions and millions more of the human race. The Empire wasn't a word to him, it was a vast and almost boundless home for honest men."—(Sir Walter Raleigh in *United Empire*, May, 1918.)

So wrote a friend of Earl Grey after his lamented death last September. By that death this colony lost a sincere friend and we can only trust that something of his broad and generous spirit, his lofty Imperial patriotism and his generous acceptance of men of every creed, race and colour as his fellow citizens in the fullest sense will continue to inspire us in this outpost of the Empire. However restless we may be at the slow pace of the colony's advance, at the continued restriction of our colonial development (a restriction nowadays entailed mainly by war conditions,) to a belt of cultivation reaching for the most part only five or ten miles from tide-mark, we can at least realise with satisfaction that every feature set forth in Earl Grey's view of the British Empire as a whole is fully represented in this particular part. Equality of opportunity is the ideal of the Empire, an ideal which no Empire or Republic of ancient or modern times has more consistently pursued, and no British possession has more fully realized that ideal than British South America. That the colony recognises the special advantage it enjoys in regard to such equality of opportunity has been shown by the co-operation of all its citizens in the past for the purposes of the war and by their insis-

tent expressions of willingness to make any sacrifice of men, materials, or treasure in the future which may be necessary for its successful prosecution.

Since the last issue of "*Timehri*" the colony has continued to go about its lawful occasions "under the sure shield of the British Navy" in almost every respect as if the war were in another planet. Prices of necessaries certainly have gone up to an extent which the war may perhaps explain and even justify but which has led among the less highly paid civil servants of the colony to co-operative action for the purpose of enabling them to preserve some more definite relation between their salaries and the constantly increasing cost of living. The better paid officials have given their support to the action of their subordinates. The movement has no aggressive features and as it is proceeding along purely practical lines can only lead to beneficial results in regard to the control of profiteering charges not only for the benefit of the officials but for the public at large.

The proposal of this Society to hold the postponed West Indian Agricultural Conference in the colony this year has not been realised owing to the unexpected prolongation of the war through the betrayal of Russia by the gang of international anarchists and German spies who control the Bolsheviki dreamers. Our kindred scheme of a Colonial and Inter-Colonial Agricultural and Horticultural Show to be held at the same time as the Conference has also been postponed. We recognized the practical difficulties but wished to make sure that this part of the Empire will not be as unprepared for peace as the Empire was for war. The prevalent idea of deferring all progressive action in this colony until the war is over and until more energetic communities can voice their more articulate claims on British capital leaves us cold.

On the other hand the cattle-track between the Berbice River savannahs and the Rupununi in the neighbourhood of the Brazilian border has been actively pushed forward by its originator, Mr. Melville, Commissioner of the Rupununi District. By the end of the year we may see its completion. It is in the nature of a rough traverse across the colony through practically unknown country. Some of us would have preferred to see it accompanied by railway and economic reconnaissance parties as a preliminary to a flying survey for a trunk railway. Such a railway reconnaissance will be indispensable. An economic survey will also be necessary to reassure the Imperial authorities or any Canadian or other railway capitalists as to our resources. The ground to be covered by the cattle-track would however coincide only in part with any probable railway route to the interior and there appears to be a temporary apathy at the moment in regard to the development of the interior which is easily accounted for by a considerable concentration on coastland sugar and rice due to the war prices and local speculation in sugar estates. Tropical colonists prefer to take short views of life. Meanwhile although no preliminary steps are being pressed upon the Government by the electives or by public opinion or by the press for the purpose of ascertaining the possibilities of opening up communication with Brazil

we may congratulate ourselves that His Excellency Sir Wilfred Collet, K.C.M.G., immediately on his arrival realised that the cattle route was at least a reasonable experiment in that direction and caused practical shape to be given in the Combined Court to a scheme which had been recommended to the Colonial Office by Mr. Clementi during his acting term. It had been advocated by Schomburgh about 1840. The idea had been played with by Sir Alexander Swettenham. It is due to the present Governor that it is more than half completed after remaining in abeyance for 78 years.

The most important contribution to the solution of the problem of the interior is the confession of faith made by the late Governor of the colony, Sir Walter Egerton, K.C.M.G., at the Society of Arts on the 30th April, 1918. The part of his lecture which relates to the trunk railway is reproduced in Appendix I with an editorial note. The adoption of the programme which the Society and its magazine advanced in anticipation of his arrival in 1912 and re-affirmed in 1913 and 1914 is a most satisfactory testimony to the cordial relations which were maintained between the Society and his late Excellency. On the schemes of constitutional change advocated by Sir Walter this purely non-political Society can express no views. It is believed, however, that the colonists will support the progressive programme of any Governor independently of the alleged or real defects or advantages of any particular form of constitution whether the same be a legacy of the Anglo-Dutch pioneers or a reform emanating from later conditions. Many still adhere to the poet's heresy that whate'er is best administered is best.

The colony agrees with Sir Walter that apart from the question of the interior the chief problems awaiting solution are :—

(1) Conservation of the present population and increase of its natural growth by improving sanitation especially in the towns, where the death-rate habitually considerably exceeds the birth-rate.

(2) Provision of good water supplies both in town and country.

(3) Preservation of Infant life.

(4) Execution of drainage schemes to increase the area of land on the present occupied coast strip suitable for rice and sugar cultivation.

(5) Improvement of the existing coast railway.

(6) Improvement of the Georgetown harbour.

(7) An Immigration scheme to provide, at the colony's expense in the first instance, immigration of Indians and Chinese of both sexes in equal proportion.

The last as will be seen in the Appendix was the complementary scheme of the Railway Committee which no doubt must now be re-adjusted to the new conditions.

To these we should like to add (1) A scheme of colonization similar in character for West Indian negroes ; (2) The adoption of up-to-

date machinery for cultivation and manufacture by co-operation, with Government assistance, if necessary, among estates which have recently been acquired by local investors. (3) The re-adjustment of the economy of the large estates by means of labour-saving appliances in view of the collapse of the old indenture system and the probable slow development of any substituted colonization scheme. (4) The frank recognition by the planters that cane-farming may henceforth contribute to the removal of some of their labour difficulties if developed under a proper system of reciprocal aid and supervision by planters and farmers acting in a cordial alliance. The comparative but encouraging success which has attended the Farmers' Conference of this year is a hopeful sign of the prospects of such an alliance. (5) The adoption by the Imperial Parliament of such a policy of Imperial preference or restriction of unfair competition as will reassure investors both here and in the United Kingdom.

As regards the last mentioned question the final report of the Committee on commercial and industrial policy just presented to Parliament advocates countervailing duties against "dumping" and we had the assurance of the Premier last year that the principle of Imperial preference had been accepted by the Cabinet.

To these many of us would subjoin a (6), viz., the association of the people of the colony of every race, colour and class with the defence of the colony, the West Indies and the Empire, by a scheme of universal military training in the schools, followed on adolescence by service on the Swiss or Norwegian system based upon selective draft.

THE BAUXITE INDUSTRY.

The revival of our mining industry which the war had seriously damaged has come in the last two years from an unexpected source. Few people in the colony except mineralogists by profession had ever heard of bauxite before that period. We now know that it is one of the three hydrates of aluminium (or aluminum as the North Americans following the discoverer Sir Humphry Davy prefer to call it) found either in sedimentary deposits or where some igneous rock has become weathered *in situ*. Its local geological history approximates to that of kaolin which in this colony has an excess of silicon and iron. Our best known deposits are at Akyma, 75 miles from the mouth of the Demerara River, on the dividing line between the mountain country and the sedimentary deposits of the coast. Professor Harrison has expressed the opinion that they are caused by the weathering of igneous rocks *in situ*. The ore is supplied at present by a British registered Company entirely for the manufacture of aluminium by a Company in the United States. Bauxite, however, is also used for the production of alum and other aluminium salts, as a refractory for the manufacture of bauxite-brick for furnaces, as an abrasive for grindstones and for the making of aluminium sulphate used for the quick setting of plaster. The present price of bauxite averages \$5 a ton and the ore produces aluminium to the extent of

about one seventh of its weight. The price of aluminium before the war averaged about 16 cts. per lb., and after some fluctuation has been fixed for war purposes by the United States Government at 32 cts. The margin of profit is not likely to be one to attract purely speculative enterprise. At the same time owing to the extended use of the mineral for aeroplane building and many other purposes, (especially since welding and spinning have superseded the unsatisfactory attempts at rivetting), and owing to progressive discoveries of economical processes for the reduction of the ore it should be possible to ship bauxite in increasing quantities even after the conclusion of the war. In case mineral oil from Trinidad can be had at reasonable rates we may even look to a local manufacture of aluminium. It is to be regretted that since bauxite was discovered in 1910 and even since the war British capital has neglected the opportunities offered by these accessible deposits to overtake the lead of Germany which before the war had virtually monopolized the French and Indian output. Outside of France there are no considerable European deposits although Scottish waterfalls like Foyers have for some time been used and Ben Nevis is even being tunnelled as I write to create water-power for the production of aluminium from kindred clays. In Demerara the Industry at present employs over a thousand men under admirably organised sanitary conditions.*

THE SOCIETY.

In regard to the Society the most important event of the year was the assumption of the Presidency by Professor Harrison, C.M.G., Director of Science and Agriculture after an interval of twenty-one years from his last term of office. In that period, the Society has had on many occasions his valuable assistance but by its present choice it desired to identify itself more fully with the cause of scientific agriculture in a colony whose fortunes must always mainly depend upon agricultural produce. It aimed also at contributing towards complete co-operation between the scientific and executive branches of the industry.

TIMEHRI.

Notwithstanding the greatly increased cost of production the eagerness with which the last issue was bought up within a few days has seemed to the Directors and Editors to justify the continuance of the Society's magazine in spite of the conditions which have left it almost the sole survivor of such enterprises of unendowed societies in the colonies. We are fortunate in securing from the President his valuable lecture on the Society and its work in 1897-1918. Agricultural articles are unfortunately not as easily obtainable in the colonies as those on other subjects, for a practical agriculturalist has seldom the pen of a ready writer and it is natural to expect that those in the scientific branch, (who must necessarily be mainly officials) will prefer to devote any writing talent to articles for their

* NOTE.—Since the above was written difficulties of transport have led to the decision to restrict the output and general operations until shipping can be obtained.

departmental journal. The reader will find many articles of great interest and some of high, scientific and practical value. We owe more than one to the skilful pen of Mr. Hyatt Verrill an American visitor. Mr. Verrill, who is not himself a scientist, is the son of the late Professor of Zoology at Yale and is always interesting. We will not profess to judge the merits of his cheerful excursions into the field of professional anthropologists. His blood be on his own head. We owe him many thanks for some interesting and valuable illustrations.

We have reproduced in an appendix from the Journal of the Society of Comparative Legislation, Mr. Ledlie's article on the alteration of our law from Roman-Dutch to English and on the West Indian Court of Appeal. Mr. Ledlie will be interested to know that the change has been effected without question and almost unnoticed. Although eighteen months have passed no difficulties caused by it have occupied the attention of the courts and no amending legislation has been proposed.

THE WAR.

As I write* the colony realizes that the German onslaughts of the future may shake and bend but cannot break the allied line from the North Sea to the Atlantic. It realizes that time is on the side of human liberty and British honour and that when the hour of Foch's strategic offensive arrives the result will be one as to which we can have no fear. This colony, deprived by geography of the chance of making its full contribution to the cause of the Empire, maintains its willingness to share its fate, to the last man and dollar, and looks with proud confidence to the victorious end.

" Yes—on our brows we feel the breath
Of Dawn, though in the night we wait !
An arrow is in the heart of death ;
A God is at the doors of Fate.
The spirit that moved upon the deep
Is moving through the minds of men ;
The nations feel it in their sleep
A change has touched their dreams again.

Dreams are they ? But ye cannot slay them
Or thrust the dawn back for one hour !
Truth, Love and Justice, if ye stay them,
Return with more than earthly power.
Strive, if ye will, to seal the fountains
That send the spring through leaf and spray ;
Drive back the sun from the Eastern mountains,
Then—bid this mightier movement stay.

* NOTE.—Written in June at a time when the recapture of the line of the Aisne seemed to be relegated to the Spring of 1919. The beautiful lines of Sir Alfred Noyes seem still more appropriate as we go to press in this first week in August.

NOW AND THEN OR NOTES ON THE SOCIETY AND ITS WORK IN 1897 AND IN 1918.

BY PROFESSOR J. B. HARRISON, C.M.G., M.A., F.I.C., F.G.S.

I was President of the Society in 1897 and am now so again in 1918 after an interval of 21 years, whilst I appear to be the only member who has held office at such an interval. The late Honourable B. Howell Jones, who was President in 1884, 1891, 1899, 1905, and 1909, held office in 1905 after a similar interval from his first assumption thereof.

It may be of interest to the Society to review some of the changes which have taken place in the Society and in the industries of the Colony since January, 1897. That year was the year during which the West Indian Royal Commission made its enquiries and issued its report. The influence of the Commission on some of the smaller West Indian Islands has been manifestly beneficial; on this Colony it has been, as in Trinidad and Jamaica, more or less negligible. The beneficial effects in the West Indian Islands has been due to the personal influence of two men, Honorary members of this Society, Sir Daniel Morris and Sir Francis Watts, more especially to the ability, practical knowledge and local experience of the latter. Their greatest feat has been the reorganisation of the sugar industry in Antigua and St. Kitts, and indirectly in Barbados. Their other marked success has been the establishment of the Sea Island cotton industry in Antigua, St. Kitts, Barbados and especially in St. Vincent. In both these lines the influence of the present Commissioner of Agriculture for the West Indies has been paramount.

At the time of the enquiry the sugar industry in British Guiana was directed by men who can be described as a race of saccharine giants. One of our members was in the forefront then as he still is, pre-eminent in technical sugar matters in the Colony; I, of course, allude to Mr. J. M. Fleming, of the Diamond Estates. Unfortunately for the Colony his able and zealous coadjutor, William Douglas, in my opinion by far the most able chemical engineer and sugar technologist who has been connected with the Colony, has retired from active life here, although his influence can be recognised in many of the improvements installed in our sugar factories.

Among the more able of the practical agriculturists of that time was Mr. J. Gillespie of Plantation Houston who still controls that fertile property. The remainder of the sugar giants of those days are no longer with us in the Colony; many of them have been spared the shock of the world-wide calamity wrought by that past-master of infamy, who, whilst challenging the exploits of those mighty men—Atilla, Caesar, Alexander the Great, and Napoleon, has entered into competition in the "Eternal Infamy Stakes" with Caligula and Nero, and vanquished them—hands down. In 1897 under the guise of friendship he was encompassing the

destruction by peaceful penetration of, among other British industries, that of the West Indian sugar-cane planters, and this rendered necessary the Royal Commission of that year, whilst at present by the destruction of civilisation through fear engendered by his diabolical crimes, he seeks the tyrannical control of the peoples and of the industries of the whole world.

Among the mainstays of the sugar industry whom we have lost by death are the former Presidents of this Society, the Honourables B. Howell Jones, E. C. Luard, and George Garnett, and our former prominent members,—Robert Allan, A. Barr, S. M. Bellairs, G. M. Bethune, A. Braud, S. R. Cockran, W. Craigen, J. B. Finney, Harry Garnett, A. R. Gibson, A. P. Mackay, J. B. Mayers, F. V. McConnell, J. Monkhouse, Cecil Morris, A. Summerson, and G. B. Steele; whilst of our past Presidents R. G. Duncan and F. I. Scard and of our prominent members, W. P. Abell, W. P. Ebbells, L. Jones, H. von Ziegezar, W. A. Wolsley, and C. G. A. Wyatt have left the Colony. We still have with us the veteran Charles Ross of colony-wide interests, F. C. S. Bascom, H. L. Humphrys, J. Junor and H. Seedorff.

Of those who were prominent in advocating the claims of the various Agricultural industries other than sugar, we have lost by death our former President, the Honourable A. Weber, "The Father of the Minor Industries," W. P. Binnie, Jacob Conrad that staunch advocate for practical agricultural education, Thomas Garnett, the Reverend F. C. Glasgow, the Grand Old Man of our African fellow colonists, D. M. Hutson, J. H. de Jong, foremost in the exploitation of our mineral resources, the Reverend Father Messini, the practical Evangelist of agricultural and industrial work among the Indians of the Moruga District, S. Ogle, G. H. Richter, the Rev. D. J. Reynolds, Captain White, and Bassell Winter; whilst the Reverend Gibson Fisher, constant advocate of work and progress, Dr. H. B. Ford, foremost among the earlier advocates of the banana cultivation, and our untiring expert organiser T. S. Hargreaves are in other lands, and Father Purcell, now, as then interests himself in everything for the advancement of his people and especially in their pastoral pursuits.

Among those death has claimed among our former Presidents, who were not actively interested in agricultural pursuits, are Sir Cavendish Boyle whose breezy optimism, always in the ascendant, acted as a tonic to our bygone advocates of colonial progress; G. F. Franks, prodigy of all-round interests and learning; and G. H. Hawtayne, the foremost West Indian humorist of his day; whilst L. M. Hill and Henry Kirke are enjoying their well-earned leisurse in retirement. Our then prominent members Dr. Anderson, B. S. Bayley, George Bagot, Dean Caswell, N. Darnell Davis, the historian and bibliophile of the West Indies, H. J. Gladwin, Bishop Swaby, and James Thomson of "Argosy" fame have joined the majority; but we have with us still our past President, the Honourable J. B. Laing; W. Cunningham, the Honourable G. R. Garnett, Dr. Rowland, who with J. E. Hewick was the moving force among the Berbicians, that untiring pioneer of commercial and industrial progress, C. Wieting, and J. B. Woolford, our worthy Town Clerk.

In 1897 prominent scientists who were members of the Society were few ; we have lost that eminent botanist, of world-wide reputation, that man who knew and loved both living plants and animals, G. S. Jenman, then the Superintendent of the Botanic Gardens ; as well as H. H. Cunningham, the biologist and magistrate, and S. Vyle, the electrician, but J. J. Quelch—the inimitable Quelch—and Mr. Rodway are still with us, the former in other lands, the latter at my right hand.

In 1897 I, as President, had the assistance of those keen and experienced Office-bearers, F. A. Conyers our Treasurer, and Thomas Daly, our Honorary Secretary. Both have joined the great majority.

The ranks of our Honorary members of 1897 have also been depleted by death. We have lost the first and foremost of Scientific Agriculturists Sir J. B. Lawes, F.R.S. ; our former Governors, Sir Cameron Lees, and Sir A. W. L. Hemming ; as well as Sir Neville Lubbock, Mr. F. Sutton (of the Sugar-Cane), and Mr. F. A. R. Winter.

Death has also been active among the members of the Society who were less prominent in its work, and we have lost the Right Reverend Bishop Butler, Sir Palmer Ross, W. Blair, Captain Duncan, Sir Edmonds, P. P. Fairbairn, E. G. Fonseca, Frank Fowler, W. Greig, Stewart Gardener, W. C. Halligan, J. A. Hill, C. K. Jardine, R. Jeffrey, S. S. Jones, E. E. King (one of the earliest visitors to the Kaieteur Falls), A. Kingdon, J. Manifold, C. G. Parnell, G. W. Rockcliffe, that sterling example to every creole, and W. H. Woodroffe ; whilst the following are still living but are absent from the colony :—Sir Henry Bovell, Sir Charles Cox, Sir Joseph Godfrey, Drs. Fisher, A. D. Williams, and von Winckler, A. G. Bell, S. G. T. Bourke, E. G. H. Dalton, R. Duff, C. P. Caskin, M. Garnett, C. B. Hamilton, P. Hemery, F. J. Morris, H. Rickford, Captain R. V. Shaw, B. Thompson, F. J. Villiers, and T. R. Young ; but we still have with us in the colony, hale and hearty, A. K. Duncan, J. K. D. Hill, H. H. Lawrence, H. W. Sconce, J. F. Waby, and Drs. Ferguson, London, and Matthey.

These were the members of the Society with whom I was brought in active co-operation during my Presidency in 1897 ; doubtless there were and are others whose names do not occur to me who were then active members of the Society.

Among these men were the far-sighted, energetic yet prudent colonists who, during the anxious years of the final decade of the last century and the earlier years of the present one, guided the colony through its numerous vicissitudes and laid the foundations of any prosperity it enjoyed prior to August, 1914. Many of them were working in and out of season in pressing on their fellow colonists the need for agricultural and industrial expansion and the development of all the resources of the colony whether agricultural, pastoral, forestal, or mineral. Among them were the men who laid the foundation on commercial lines of the present great rice industry ; who gave rise to the increasing exportation of balata, timber, and other forestal resources ; who did their utmost in connection

with the development of our resources in gold and diamonds and who advocated the extension of travelling facilities throughout the colony. The colony can ill afford the loss of their services; may it look forward with confidence to enjoy in the near future the unselfish, patriotic services of another group of such men.

In 1897, the Society showed more activity in practical pursuits than it has done of late years. It was not as purely a literary or book-collecting Society as it now is. Its Agricultural and its Correspondence Committees were alert and active. But even then its general interest in agricultural matters was on the wane. The reading of a paper dealing with agricultural questions to the general Society was a sufficient reason for an almost empty room; and there were not wanting signs that in the near future the rooms of the Royal Agricultural Society of British Guiana would be among the very few places where practical agriculturists could meet without running the risk of receiving gratuitous amateur advice as to the conduct of their art, the oldest known to mankind. Strange it is that the skilled agriculturists of British Guiana to whom are addressed daily, nay almost hourly, instructions as to how they can best conduct their own business in the interests of others, do not seek the security of this room in far greater numbers than they do at present.

At the commencement of 1897, "*Timehri*" was in a flourishing condition except with regard to subscribers. Even at that date it was not an agricultural but more or less a literary and especially a natural history and scientific journal. In the 1895 volume 22% and in the 1896 one, 16% only of its pages were occupied with Agricultural and closely allied matters. In 1897 during the first half year 54% of its pages and in the second 38% were occupied by agricultural subjects. Thereupon "*Timehri*" ceased to exist. But its back files are of very high value and are in constant use in the Department of Science and Agriculture.

The resuscitation of "*Timehri*" is entirely due to the initiative and energy of Dr. Nunan. The Journal is, however, non-agricultural in its bent. The Board of Agriculture issues a quarterly journal intended to deal only with practical agricultural matters. Unfortunately, this journal of late has been showing signs of degenerating into a semi-scientific and literary production. The journal has been re-organised and placed under the joint editorship of the Government Botanist and the Government Biologist. In future its Editor is always to be an Officer of the Department of Science and Agriculture who is in close touch with agricultural matters. If the members of the Royal Agricultural and Commercial Society desire the Society to retain any connection with local agriculture I suggest that the Society subscribe 8 cents per annum on behalf of each of its members who desire to receive copies of the Board's Journal, and thus place them in a similar position to the members of local Agricultural Associations.

"*Timehri*" and the Board of Agriculture's Journal should form complements each to the other. Doubtless "*Timehri*" will continue to be, as it now is, a great credit to this Society and a most important aid toward the economic development of British Guiana.

I have said that the older volumes of "Timehri" are in constant reference in the Department of Science and Agriculture. May I venture to throw out as a hint to its learned Editor that in the earlier volumes there are many papers by im Thurn, Quelch, Darnell Davis, Hawtayne, Jenman, Percival, Perkins, William Russell, A. Winter, McTurk, B. H. Jones, Kirke, Francis, Rodway, E. A. V. Abraham and others, as well as reproductions of papers by Hillhouse, Schomburgk and Campbell which if reprinted in the pages of the present series of "Timehri" would prove not only interesting but highly instructive to its readers?

At the second of the Committee meetings I attended since my re-election to the Presidency, I was solemnly warned by a prominent member of the Book Committee that the object of the Society is now purely a literary one; that it exists solely on account of its library; and that any attempt to re-introduce into it either an agricultural or a scientific trend will be attended with disaster with regard to its membership. I regret that the premier, in point of years of existence, Agricultural Society of the West Indies, and I believe the second in the Empire, has sunk into this parlous state and has degenerated into a circulating library mainly of works of fiction. That statement caused me to deeply regret that I had accepted the Presidency. Surely for an Agricultural Society which has sunk into such a condition of technical decrepitude an expert of proved ability in the perusal of sensational and ephemeral literature as exemplified in cheap modern novels, would be a far more suitable person for the Presidency than a man whose life has been spent in the pursuit of science, agriculture and horticulture?

Possibly I have misread the signs of the times with regard to the demand for novels at these rooms. May not the demand be due to anxiety on the part of many to discover a book designed to become a classic in British literature? Do they not take out, let us say for purposes of illustration, 50 novels in the hope of finding one of literary merit? but I fear 2% is too high a proportion to expect excellence in the class of literature our members are forced to consume. But keenness for ephemeral literature is an old complaint about the Society. Soon after I first joined the Book Committee in 1891 or thereabouts that a suggestion was made that standard works relating to Science and Agriculture should be added to the library, but it was considered that their purchase would prove too heavy a drain on the funds set aside for novel-readers; it was said in the Committee that if members wanted to know about anything connected with Chemistry, they might ask the Government Chemist and if about Botany, consult the Government Botanist.

During late years the Society has laid stress on having *popular gatherings*. In 1897, aided by the then Directors, I broke one of those cast-iron rules of procedure, with which our worthy Assistant Secretary, then as he does now, sought to bind down the, in his opinion hasty, activities of the Society by inviting Sir (then Dr.) Daniel Morris to address the Society at an evening meeting without giving a week's notice to the members. That address was the principal feature of that year, and we one and

all regarded the occasion of its delivery —the visit of the Royal West Indian Commission—as full of good augury for the future; but towards the end of the year the Society had another special meeting at which we pointed out that the major part of the Commission's conclusions and recommendations, or rather the want of a certain one among the latter, was fraught with the gravest danger to the future of the colony. Neither of our conclusions has proved to be correct.

Those meetings were the forerunners of many which have since taken place where the Governor of the colony in his capacity of Vice-Patron of the Society has occupied the chair. I remember that I was soundly rated by a very prominent member, a high Official of the Government, at a meeting of the Directors for this innovation which I had ventured to introduce. Of course Government officers in presence of the Governor have to weigh their words and to restrain them, and may not be justified in expressing their own opinions in full. But the presence of the Governor in the chair at special meetings of the Society has manifest advantages which far outweigh such objections.

These popular meetings of the Society doubtless serve an excellent purpose and being frequently illustrated by lantern slides, have greatly added among the members of the Society to the general knowledge of the back-lands of the colony and their human, animal, and bird inhabitants. These meetings have already greatly extended the general knowledge of the potentialities of the southern section of the colony.

On the other hand Georgetown now appears to be satisfied with verbose discussions at popular meetings and in the newspapers as to the future, and with picturing the time when the citizens will be able to attend at a railway station to see others (not themselves) start for the interior. In 1897 and in its immediately preceding years many citizens ventured into the interior; now with greatly increased facilities fewer visit the interior and fewer still are willing to invest money in its exploitation; the cry is now for others to do all this.

There was a period in my life, which period terminated some 43 years ago, during which I was required to do what certain reformers and enthusiasts now regard as a waste of precious time—to study certain dead languages in addition to a very few modern ones. I still retain some faint memories of these studies and among them I remember a play written by Aristophanes (*Ornidis*, the Birds) some 2,300 years ago. It is a prophetic picture of the present state of this colony. We are living in a *Nephelokokkuyia* and we fix our gaze on another *Nephelokokkuyia* to be founded by some one, at some time, and somewhere, in the back of beyond. Verily of recent years the great majority of us have been satisfied to be citizens of that delightful place of abode, that city of unfulfilled schemes, unfruitful projects, fleeting energies, but of constant verbose though misty discussions—Cloud-Cuckoo-Town.

The sooner we cease to be satisfied with such a residence and the sooner we take steps to energetically and scientifically exploit the great riches of the more readily accessible parts of the colony the better for us, for the colony, and for our posterity.

But not all of us have been satisfied with occupying this position. There is one firm whose efforts towards the development of these parts of the colony—the exploitation of which has belonged to practical politics,—stand out conspicuously. In British Guiana the firm of Sprostons has always been in the forefront of progress especially with regard to travelling facilities, and the exploitation of the colony's mineral and forestal potentialities. In my presidential year, 1897, the firm completed their Demerara-Essequibo railway and worked out their transport facilities for the Essequibo and Potaro districts, facilities which have been a boon to numerous inhabitants of the colony and which I trust in the near future will render the great mineral, forestal, and water-power potentialities of this section of the colony of world-wide fame.

In my opinion it has not been in the best interest of the colony at large that Sprostons have been handicapped by the installation of the Colonial Steamer Service. It might have been better if every effort had been directed towards the development of the colony and the exploitation of its resources by bringing pressure on Sprostons and utilising to the fullest extent their long and varied experience and all the capabilities of their establishment.

With a view to the future development of the vast interior of the colony and its opening up by a central railway, it appears to me that we should be wise if we followed the example of Sprostons and directed all our energies towards the exploitation of the nearer hinterland and utilised the lands thus developed as a base from which to drive the projected central railway.

AGRICULTURAL EXHIBITIONS.

The Horticultural Shows formerly held under the auspices of the Society were at their zenith in from 1897 to 1901. Unfortunately the Directors of the Society, resenting the Board of Agriculture being placed in control of all Government grants for agricultural matters, refused the Board's offer of funds for an Agricultural Show in 1903 and have since more or less held aloof from them.

It is, I believe, now the desire of the Society to take a very active share in any future show which may be held in Georgetown—either County Shows for Demerara or Colonial Shows for the whole colony.

It has been suggested that a Colonial Show should be held in the near future to which Surinam as well as the British and French colonies in the southern West Indies will be invited to compete. If possible this Show should take place at the same time as an Agricultural Conference for the West Indies is held in Georgetown. The only obstacles in the way

of the combined Show and Conference are war-conditions and possible difficulties of transport between here and the other countries and colonies which we desire should be represented at the Show and Conference. The Board of Agriculture has already expressed its view that the next Agricultural Conference and Exhibition should be held here whilst the Combined Court has expressed its favourable opinion on the suggestion. The Commissioner of Agriculture for the West Indies, however is in control of all Agricultural Conferences and it is doubtful if he will favour the holding of one during the duration of present war-conditions.

As an excuse for the Society's apathy during recent years in connection with agricultural matters it has been alleged that the Board of Agriculture has usurped the Society's functions. It is not so; at the inception of the Board every care was taken to avoid not only usurpation but any overlapping of duties. It was considered that the Agricultural Society, by its meetings and its Committees where agricultural papers would be read and discussed, would carry on its joint share of the work, but this has not been the case.

I fully realize the grave difficulties which exist in the Society arranging for meetings at which agricultural matters can be discussed by practical agriculturists. These are mainly due to the fact that very few managers of plantations are resident within a few miles of Georgetown. In the earlier years of this century these difficulties were insuperable but since the advent of the motor-car to the colony the position has changed and it ought to be feasible to arrange for such agricultural meetings. Agricultural meetings should take place in the early afternoon say at 2 p.m. or perhaps earlier and not in the late afternoon or evening as other meetings of the Society do.

In 1897 the Committee of Correspondence of the Society, which during many years of the Society's existence had been its working force, was an active organisation, but it gradually fell into abeyance. It was the means by which the Society undertook the representation of the colony at foreign exhibitions; now the Permanent Exhibitions Committee has to do this.

That Committee, on which the Society is well represented, constantly requires the advice and assistance of this Society to make its work successful. Personally I advocated that the work now carried on by the Permanent Exhibitions Committee should continue to be done as in the past by this Society but the abolition of the Committee of Correspondence formed an obstacle to this.

AGRICULTURAL EDUCATION.

The Society owing to the persistent efforts of the late Honourable A. Weber and the late Mr. Jacob Conrad in the early nineties took a very keen interest in agricultural education and contemplated the establishment of a Farm School. In April, 1891, the Society appointed a special Committee to enquire into the feasibility of such a school. The Committee made very full enquiries and reported in September, 1892 regretting that on account of the heavy expenditure involved in the

establishment and maintenance of such a school the proposal was not then a feasible one. A difficulty also was that the sugar proprietors of those days were unwilling to employ creoles of the colony as overseers. One of the first proposals regarding an Agricultural College for the West Indies may be found in an address I delivered to the Agricultural Society of Barbados on November 9th, 1886. Alluding to the necessity for properly arranged and conducted agricultural experiments and of trials of manures, etc., to be carried on with every scientific refinement, I said "The latter must follow when we shall have established "that great want of this Island and of the whole West Indies "an Agricultural College, or preferably station, devoted to the study "of the growth and requirements of tropical plants in tropical climates, "and to imparting the knowledge so gained to the younger planters. "I am myself convinced that far more success, both socially and financially, will be attained by directing the studies of our youth to the "phenomena of nature rather than as at present, chiefly to the tales and "traditions of the ancient Greeks and Romans."

In my opinion the desirability of (a) a central Agricultural College for the West Indies and (b) Agricultural or Farm schools in various districts in British Guiana, has not altered since the Society considered the question in 1891-92 and again referred to it in 1897.

The Society's interest in this highly important question appears to have waned during recent years, but still some interest has always been taken in it by certain of the members. Strangely no recommendation as to the establishment of an agricultural or farm school in this colony appeared in the Report of the West Indian Royal Commission. Yet Sir Daniel Morris very consistently and correctly held that it is most difficult for men trained only in the rough and ready agricultural methods of sugar plantations on heavy clay soils to make such cultivations as those of coffee, cacao, cotton, limes or other fruit-crops and rubber commercially successful. He held on very strong grounds that many of the failures with regard to trials made with some of these products prior to 1897 were due to lack of technical training. Every cultural pursuit which is dependent on intensive arboricultural or horticultural methods requires far more scientific knowledge, practical skill and unremitting minute attention than such extensive crops as sugar and rice call for.

In 1908-9 a Government Committee enquired into the question of the establishment of an Agricultural School and reported favourably on it. Later the then Governor, Sir Frederic Hodgson, after careful consideration, approved of a portion of land belonging to Onderneeming School Farm, and situated at a distance of half a mile or more from the Industrial School, being used for the school. He visited the place accompanied by Sir Joseph Godfrey and myself and personally selected the site for the buildings. By vote of the Combined Court a large area of the land selected, including the site for the building which was an excellent one on a high sandy reef, was cleared. But on a change in the Government the question was again held up, and I fear that until the war is

ended the establishment of an Agricultural or Farm School may not rank as among local practical politics. The Agricultural Department has made during the past six years numerous enquiries about suggested sites for a school. At present Plantation Grove near to Belfield which is the property of the Government appears to be the place best suited and available for the establishment of a farm school, which will especially meet the requirements of the well-populated East Coast district. I have not in any way changed my conviction that the lands at Suddie are from a practical point of view by far the most suitable as a site of a *Colonial* farm school.

The success locally of a more or less theoretical Agricultural College is very problematical, and experience elsewhere in the tropics gives us pause in advocating the establishment of one under the present conditions of lack of intensive cultivations in this colony. The success of a *practical farm school* is, in my opinion, beyond discussion. I often wonder whether any practical step will be taken towards the establishment of such a school but more especially of a Central West Indian Agricultural College before my official connection with these colonies terminates, as it will do, in or before 1921.

A carefully digested scheme for the training of pupil assistants in the Chemical, Botanical, Entomological, Veterinary, and Agricultural divisions of the Department of Science and Agriculture was adopted two years ago by the Combined Court, but up to the present it has been a complete fiasco, as in this very utilitarian colony the great majority of persons appear to expect their sons not only to be given a free scientific and technical education by the Government, but to be paid for accepting it. Hence no application from any qualified candidate for training under this scheme has been received.

DISTRICT AGRICULTURAL SOCIETIES.

The Agricultural Societies of Jamaica and Trinidad have received new leases of life and greatly increased activity through their affiliation of District Agricultural Societies. It is to be regretted that this Society is not in a position to follow their example with regard to the large numbers of such societies which are springing up here.

For administrative purposes such as the holding of local shows and farmers' competitions, District Associations can be affiliated to the official Board of Agriculture but there are many ways in which affiliation under a non-official Agricultural Society taking an active interest in agricultural questions as this should do, would be advantageous to them and to the colony.

LOCAL FOODSTUFFS.

In the early nineties the Society devoted much attention towards the quality and purity of our foodstuffs and towards the conversion of locally grown vegetable products into permanent ones; the latter, however, with scant success. Mr. da Silva, of the Pomeroon, was the pioneer in this work and the files of "Timehri" show the direction in which he successfully turned his energies from 1893 to 1897 or thereabouts. The Society

fully recognised by its awards to him the worthy nature of his work in preparing meals from colony-grown materials, and cattle-foods as their by-product. These awards settled the question as to whom credit for first preparing such products on the small commercial scale is due.

Under present war-conditions the position with regard to locally-produced foodstuffs has become very acute. The Government has adopted the report of a special Committee and is endeavouring to get from the United States the machinery for the equipment of a factory for converting rice and maize into ground rice, rice flour, and cornflour. The success of this should be assured and should lead in the future to an export trade in ground rice and rice flour. It is hoped that it will be feasible to equip the factory for the commercially successful production of various flours from plantains, bananas, cassava, various pulses and ground provisions generally. It must, however, be carefully borne in mind that a factory of this sort working on a commercial scale is an entirely novel proposition. It is one which we hope will prove successful, but it will be entirely dependent for success in its working on receiving ample supplies of the various raw materials from planters and farmers. Unless it can work continuously and at its full power its failure is a foregone conclusion.

At present there is an acute necessity for the increased local production of foodstuffs of every sort. Fortunately the great areas now cultivated each year in rice ensures our cereal supply. We can readily add to our supply of nitrogenous foodstuffs by the cultivation of pulses. Fats are our main difficulty; the sole sources being butter, ghee, margarine, and lard, from live-stock and coconuts. I will consider the position of live-stock and coconuts later in this address.

Our present position regarding foodstuffs is, in my opinion, a very serious one which calls for strenuous efforts on the part of all cultivators, large as well as small. If the larger agricultural proprietors do not set an example we cannot reasonably expect the smaller ones to do so. We must give up our favourite position of "Words not work" and we must recollect that in our case the adoption of the motto "Wait and see" will almost inevitably result in its transfer to a more practical form of "Waited and starved."

ADULTERATION OF FOODS.

This Society has at intervals given attention to the important subject of adulteration of food. It did so soon after my arrival in the colony in 1889 and as soon as it became feasible the Government requested me to make special investigation into the alleged prevalence of adulteration in foodstuffs imported into the colony. Assisted by the late Mr. J. Williams, F.I.C., then my private Assistant, and at the time of his death in July last year First Assistant Analyst I did so, and the results caused the Government to take action by passing an effective Ordinance for controlling the Sale of Food and Drugs in 1892. When I was last President of the Society the campaign against adulterated foodstuffs had been carried on energetically for some three or four years. Since then the Government Laboratory has given steadily increasing attention to the Ordinance; the

working of which is controlled by the Director of Science and Agriculture. Its progress is well shown by the following comparison of analyses made in 1897 and in 1916 and 1917 and of their results :—

	1897 FIGURES.		1916 FIGURES.		1917 FIGURES.	
	No. of Samples.	Adulterated.	No. of Samples.	Adulterated.	No. of Samples.	Adulterated.
All samples	469	28.6%	1,917	16.9%	1,727	14.8%
Milk „	285	38.7%	1,590	18.2%	1,612	15.4%

The purity of the milk supply of Georgetown has of late been in a very unsatisfactory condition as compared with that of the colony at large. Its rate of adulteration is about 33% higher than that of the colony at large or 50% higher than that of the country districts. During the past six years the mean rate in the town, 18.4 per cent., has been 57 per cent. higher than the country rate, 11.7%. It will require strenuous and steadfast efforts on the part of the Officers of the Town Council, of the Police, and of the Government Health Department to reduce the present rate of adulteration in milk to the very satisfactory condition it was in from 1909-1912 when the Georgetown rate was only 8.1 per cent. and was lower than that of the country districts.

A mistake which is not infrequently made is to assume that the percentages of adulteration shown by the official examinations either represent or are less than the actual rates of adulteration. This is not so. These percentages represent the rates of adulteration found in samples the purity of the majority of which is not above suspicion. Hence the rates must be regarded as higher than the actual rates and as showing the purity of a milk supply in a somewhat less favourable light than the true one.

When, owing to the representation of this Society, the Government took action with regard to the sale of adulterated foodstuffs, the quality of imported foodstuffs as far as could be ascertained by analytical methods was, as it appears to have been throughout the West Indian Colonies, very unsatisfactory. Practically with the sole exception of wheaten flour, every foodstuff that could be successfully sophisticated was adulterated and not infrequently to very great extents. This has been stopped; the Government acting on the advice of unofficial members of the Legislature introduced a system of pre-analysis and prohibition of landing for the majority of foodstuffs amenable to adulteration, and at present in this colony samples of such foodstuffs in an adulterated or even low grade condition are few and far between. During the 21 years the rate of adulteration in foodstuffs offered for sale in the colony has been reduced by one-half.

At present the colony is probably in a far more favourable condition with regard to the standard of quality of, and freedom from adulteration in, its imported foodstuffs, than is any other in the British West Indian Province.

LOCAL DAIRY-FARMING IN 1897.

In 1897 the colony possessed in the dairy at Nonpareil an excellent example of dairy-farming, butter-making and swine-production. I cannot do better than read the late Harry Garnett's description of his venture:—(page 348 of "Timehri" for 1895.)

"The plant consists of a powerful Separator with engine and gearing, Butter worker, Churn and Pasteurizer. The milk is bought from coolies in a room situated over the dairy, it is measured and a ticket given with a number. The milk is then poured into a receiver which delivers into a feed tank of the Separator, in this the milk comes out of one spout and the cream out of another, the skimmed milk is then taken by a small centrifugal pump and pumped over the Pasteurizer. This consists of a long column, the top half being filled with steam and heated to 180° Fah., and the bottom half is a refrigerator, through which cold water passes, carrying the milk down to a normal temperature. The advantage of this is, that if there happen to be any germs in the milk they are destroyed and milk treated in this way keeps much longer.

"The churning is done with cream that has been ripening for 24 hours.

"The business in Georgetown is about 150 pints of fresh milk which is also pasteurized before it comes down, and 100 pints of skimmed milk, and 20 lbs. of butter per day, with a varying quantity of cream. The Dairy is capable of turning out one ton per week. We have also a cheese-making plant, and a press for cream cheese.

"The plant was started in 1891, and has worked steadily every day up to the present, including Sundays without a stoppage. We deal on the average with about 36,500 gallons of milk per annum. As you will see a very small proportion of this is sold, the balance we make into salt butter and use it on the estate, and the skimmed milk is given to pigs of which I have a herd of nearly 100, imported from Saunders Spencer, who is the best breeder of Yorkshire pigs in England. The pigs fed on skimmed milk put on 20 lbs. per month, and this is the only thing which prevents the actual Dairy work proving a loss."

Dr. F. G. W. Deane criticised the above account and spoke of milk as being not altogether such a nutritious food as was generally supposed on account of its not containing any iron. I well remember Dr. Deane's criticism because it enabled me to point out a hitherto unrecognized redeeming feature in the action of the East Indian milk-seller in adulterating milk with trench water,—that the latter supplied the missing iron and so converted the naturally defective milk into a mixture having a well-balanced nutritive ratio.

TROPICAL SOILS.

During the past twenty years much attention has been devoted by agricultural chemists and geologists to the problems involved in the formation of soils *in situ* from igneous rocks in the tropics.

At the day I assumed office as President and for some months later I was credited with some knowledge of the geological and chemical modes of origin of soils in the tropics, and of their suitability for intensive agriculture. Before December 31st, 1897, I had forfeited, except perhaps among expert scientific agriculturists, geologists, and chemists, every claim to even the most rudimentary knowledge of these important problems. I had committed the unforgivable sin of doubting whether the "Back of Beyond" in British Guiana is, as it was then ascribed to be by the great majority of those who had never left the coastlands, a land of marvellous fertility. None of the older travellers had so described the hinterland. Its remarkable fecundity was discovered in 1882 by an official writer who had not visited the colony and had not had any opportunity of examining its soils either chemically or culturally and who wrote "In British Guiana, for instance, cultivation, so far, is wholly confined to about a dozen or fifteen miles along the sea-coast; while the vast, rich lands of the interior are wholly untouched" and "in British Guiana alone, there is an area of country equal to two Ceylons quite untouched." Although the writer had no data on which to base his opinion of the richness of these lands it was accepted as highly reliable and became practically authoritative.

Early in 1897 the Government directed me to examine a large series of representative soils from the near interior, principally from the foothills of the colony. I did so and no one was more astonished at the nature of the soils collected and at the results of their chemical examinations than I was. I had seen up the Demerara River near Mallali soils which appeared to me to be very well suited for cacao cultivation. In fact from their general appearance I expected to find them more fertile than the Grenada cacao soils of which I had just completed a study. But this proved not to be the case.

The general characteristics of the soils examined, except of those obtained from river-alluvia and valley-bottoms, were their extremely high contents of insoluble constituents, either quartz-sand or pot-clay, their high contents of ironstone or of bauxite, and the very low content, in some cases almost complete absence, of the lime, potash and phosphoric acid and of the nitrogen the presence of which is essential to soils of even medium fertility.

Similar studies were made by many other agricultural and soil chemists in other tropical lands in 1897 and during the next few years with the result that the defects I considered I had found in soils from the interior of British Guiana were conclusively proved to be almost universally characteristic of tropical residual soils on extremely ancient granitic or gneissose, dioritic and schistose lands as well, as in places, on massive lavas.

A great mass of scientific literature has arisen and many, not infrequently acrimonious, discussions have occurred on the modes by which rocks, which under temperate or even under sub-tropical conditions give rise to soils of from fair to very marked permanent fertility, in the tropics

produce soils of extremely low and transient fertility from the point of view of intensive cultivation. This action on basic rocks has been named "lateritisation" and the more characteristic of the soils have been termed "laterite" or "lateritic soils." No name has as yet been given to the somewhat similar but less complete action by which acidic rocks under tropical conditions produce vast areas of almost barren white or greyish sand or even of still more barren snow-white kaolin.

A journey down the Surinam Railway to its terminus Dam on the Sara Creek supplies excellent examples of such lateritic, sandy and kaolinic areas and is at present the readiest way of ascertaining the nature of many of the divides between river basins for 120 miles or so from the Guiana coastlands.

The action which converts igneous rocks into quartz-sand, kaolin, bauxite and ironstone results in the formation of relatively sterile country such as that on the watersheds and divides between the great rivers of this Colony. Great losses of capital have been incurred in other countries by planting permanent economic products on lateritic or kaolinic lands covered with high forest but which, although apparently very fertile to the ordinary observer, are not of permanent fertility. The Imperial Commissioner of Agriculture for the West Indies has specially asked for a paper for the West Indian Bulletin on this subject.

In 1910 I published a paper in the "Geological Magazine" on the formation of the "earths commonly termed laterite" in British Guiana which dealt not only with these *in situ* on the basic rocks but also with the kaolinic earths *in situ* on the acidic rocks. The accepted authority on the marvellous fertility of the interior of this Colony after reading my paper wrote to me under date of March 1st, 1911, as follows:—

... "Your paper on laterite as a product of weathering of "the igneous rocks, British Guiana, is very interesting to me. I "came across plenty of laterite in Ceylon and very unpromising and "intractable material it was for agricultural purposes.

"It was possible in some districts, however, to turn it into "account for growing tea. The iron in it seems to suit the tea "plant; but it was poison to coffee. . . .

"I have spoken a good deal lately about the possibilities of "development in British Guiana. My facts are nearly all derived "from the evidence you gave before the Royal Commission"

In my 1897 address I carefully confined my statements as to low fertility to "the non-occurrence of great tracts of land of exceptional fertility" whilst I stated that "tracts (*i.e.*, of land of exceptional fertility. J.B.H.) of limited area may occur in valley land and river bottoms or on lines of dykes of certain classes of intrusive rocks."

The fact that residual soils formed *in situ* from igneous rocks in the tropics are of low fertility, and that this is caused by leaching and elutriation removing the constituents of the rocks which are essential for the formation of fertile soils involves these substances accumulating else

where. Unfortunately large proportions of them are washed into and carried away by river-waters and hence accumulate finally in the ocean but fair proportions of them are deposited and retained elsewhere giving rise to fluvial and valley alluvia which are usually fertile and in places very fertile. This is the condition characteristic of the parts of the interior of the Colony which I have visited—vast tracts of lands of low fertility situated between the courses of the rivers, and other wide areas of land of far higher fertility which occur along the banks of the rivers and especially in the bottoms of the numerous valleys in these districts.

I have here specimens showing the way in which under tropical conditions massive rocks change directly into earths—lateritic or kaolinic. This one is a specimen of a diabase from Hope near Kumaru on the Demerara River in which is seen the massive rock changing in the space of less than one fourth of an inch into an ochreous lateritic earth; this is a hornblende-schist from Yarikita, North West District, in which a similar change is seen; whilst the third specimen is an epidiorite from Issorora, North West District, which is changing quite abruptly into a bauxitic earth or laterite. This specimen, which I collected at the Penal Settlement, was a massive granite which now as you see crumbles down to sand when rubbed between the fingers; whilst this one is a skeleton in quartz of a fine-grained granite-gneiss in which every trace of felspar, of mica, and even of kaolinic residues has disappeared leaving a spongy-looking mass which nature will gradually break up into a white, sharply angular, quartz-sand.

These specimens show the final products which rocks, which in temperate climates gradually change to fertile soils, resolve into from weathering or lateritisation in the tropics—quartz-sand, bauxite, iron-ores, (limonite or goethite) and kaolin.

The writer of the letter of March 1st, 1911, stated that “my facts are nearly all derived from the evidence you gave before the Royal Commission.” That evidence as far as it related to the soils of the interior was as follows:—

“There are places where cacao is growing fairly well on the Demerara River, but the soils that would be more suitable for cacao are situated a long way back. The nearest soils I have noticed which would be really first-rate cacao soils are 100 miles up the river. They are situated where there are dykes of dolerite. There are soils fairly suited to the growth of cacao where the heavy clay of the front lands of the Colony begin to merge into the sand-reef formation.”

“There is no doubt you could find soils suitable for almost any tropical product here; it is only a case of having investigations of the soils of the Colony made. We know about many of the soils on the front lands, but beyond that we know very little of what we have got. We know there is a great belt of sandhills, but it is no use looking for good soils there from the very nature of the formation, but on the sides of some of the lower hills we find soils

"which are evidently of very considerable fertility. The dolerites
"here are deep-seated representatives of the West Indian lavas and
"where dolerite occurs we should find soils similar to those in
"Grenada and they should be suitable for coffee, cacao, and spices."

"Where green-stone or trap dykes occur the soils appear to be
"fertile and well suited to cacao, coffee, and spices, hence probably
"in the interior there must be many fertile valleys and hillsides.

"The granite and gneiss of the Colony produce either sands or
"cold heavy clays (here usually the latter) which are of low fertility.

"In the interior of the Colony the belt or ridge of sand hills,
"from 30 to 50 miles in breadth, is useless, except for the support of
"forest. But in places on the lower hillsides are soils derived in
"part from indurated clay, which appear to be very fertile and
"which might be cultivated in cacao, coffee, or spices."

The indurated clay alluded to in the above quotations is the argillaceous laterite or resilecified bauxite which covers large areas in the more northerly parts of the interior of the country. The green-stone or trap dykes comprise the large areas where the country is either a fairly recent diabase or dolerite or an epidiorite or hornblende-schist, the metamorphic products of an ancient gabbro or diabase.

Where the country consists of sericite-schist or of chlorite-schist it is usually of fair to satisfactory fertility although the surface soils are from a chemical point of view somewhat poor; the soils on the schists are generally of great depth whilst their lower layers are interspersed with numerous fragments of decaying rock. The finest forests I have seen in my travels in the Colony are on lands of this nature occupying great areas between the Barama, Mazaruni and Puruni rivers. These schistose-lands are well suited for the establishment of arboricultural ventures such as coffee, cacao, limes and Para rubber.

Since 1897 several hundreds of samples of soils from the interior of the Colony have been analytically examined in the Government Laboratory, whilst I have personally visited many parts of the interior of the Colony, but I have found no reason for modifying my opinion as to the distribution of its soil resources for intensive agricultural purposes.

In April, 1907, when reading in London a paper on the resources of the Colony I summarised the results of our enquiries to that date as follows:—

... "The results of the examinations of the various parts of the
"Colony and of the soils characterising them have shown that it
"must be divided into three great belts, each of which has its own
"special economic resources. The belts are as follows:—

"1. The alluvial coast-belt is an agricultural one of very exceptional fertility, and its soils are probably among the richest and
"most fertile ones in the tropical parts of the world. It is well suited
"for many forms of tropical agriculture.

"2. The widespread belt of the lower hills and plains is "covered with a seemingly inexhaustible forest containing many "kinds of trees which yield timbers and other products of commercial "value. As far as has been ascertained its soils are mainly sedentary "ones, the decomposition-products *in situ* of its country-rocks, and "are of low agricultural value. Our Dutch predecessors were well "aware of their low value and with characteristic sagacity, after a "short experience of attempting to cultivate some of the more prom- "ising soils in the lower parts of the belt, abandoned them, and after "empoldering cultivated parts of the exceeding fertile coastlands to "which, later, they appear to have confined their agricultural efforts. "But the country-rocks in this forest-belt are in many parts of it "gold-bearing to a marked extent, and are subject under the pre- "vailing conditions to singularly complete decomposition, with the "result that auriferous deposits in places of high value, are found "over large areas of it. Its resources are therefore almost "wholly, if not entirely, confined to forest, and mineral products.

"3. The savannah-belt, at present practically undeveloped, "but which in time may become a great district of cattle-ranches."

The commonly held view that soils in the tropics must be of very high fertility is directly contrary to facts. The intensity of all chemical action in the tropics, and especially of oxidation and hydration, is opposed to the production *in situ* of widely spread areas of soils of high fertility. The most fertile parts are and must be the alluvial and fluviatile plains, especially those which have been formed under swamp-conditions where accumulations of vegetable debris and of nitrogen take place. Such are the front-lands and the great areas to the northwards of the lowest series of rapids and cataracts on the lower river courses of this Colony. The idea that tropical soils merely want tickling with a hoe to produce large and remunerative crops of economic products is an error; tickling a soil in the tropics always results in the production of immense crops of weeds. I am satisfied from nearly forty years' experience in connection with tropical agriculture that permanent cultivation in the tropics requires a higher degree of skill and more persistent and sustained effort than it does in temperate or sub-tropical lands.

My considered views are and always have been in accordance with the strong recommendations made by Sir Daniel Morris in his report on the Colony to the Royal West Indian Commission "that no time should "be lost to utilize without delay the most accessible Crown lands of the "Colony, leaving to the future the development of interior lands, which "will require means of communication of a more costly character and "that at present the want of easy means of communication and quick, "cheap transit to town of produce prevents lands above the first falls in "the rivers being used for agricultural purposes. When, as is probable, "such communication is provided the development of the interior lands

"of British Guiana could be begun in earnest. There are, however, extensive areas of river lands already accessible, and these as has been already suggested might be first taken in hand."

I trust that by the remarks I have made to-day it is clear that I have not been guilty of the wholesale condemnation of the fertility of the lands of the interior of the Colony which has oft been imputed to me. I have taken this opportunity of placing before the Society the views I have formed during long-continued study regarding tropical soils as a reply to the many misrepresentations which have been made about my views, among other places recently in an uncalled for and offensive manner in the pages of this the Society's official organ. On the other hand I have inculcated, and I still advise, caution in the acceptance of such unguarded assertions as that "These undeveloped Guiana lands are amongst the richest existing in any part of the tropics."

PROGRESS OF AGRICULTURAL INDUSTRIES.

SUGAR-CANE.

The area under sugar-cane had decreased from its maximum of 84,477 British acres in 1884 to 78,250 in 1896-97 whilst the export of sugar had shrunk from 134,870 tons its maximum, which was obtained in 1887, to 105,270 in 1896; the total production for that year being about 113,000 tons. In 1917 78,346 acres were under sugar-cane, the export of sugar being 114,000 tons, representing a production of about 122,000 tons. For 1918 there are 77,830 acres planted.

During the period 1897-1918 a very great change has taken place in the varieties of sugar-cane cultivated in the Colony. My records indicate that in 1897 there were about 69,000 acres planted in Bourbon acres and about 1,350 planted in other varieties. For 1918 about 3,850 acres are planted with Bourbon canes alone, 4,500 with Bourbon mixed with other varieties, and about 69,475 acres either with new seedling canes locally produced or with varieties recently introduced.

The leaders in the sugar industry to whom the initiation of this remarkable change was due were Messrs. Fleming and Douglas of Plantation Diamond and Scard of the Colonial Company; the late Harry Garnett of Nonpareil, the late Cecil Morris of Plantation Albion, and the late Honourable B. Howell Jones, C.M.G., whilst later leaders have been the late R. G. Duncan, and the late J. Wilson, with Messrs. R. Strang, W. M. B. Shields, R. E. Brassington and A. E. Bratt.

Among sugar-estate proprietors who personally were not planters the late Messrs. George and Thomas Garnett were pre-eminent in encouraging research with the object of obtaining new and better varieties of sugar-cane. As far back as 1895 they established under my scientific direction an extensive nursery for new varieties of sugar-canes at Planta-

tion Vriesland and it was in this nursery that they had the credit of first recognising the suitability of the new widely planted variety D 625 for soils in which the Bourbon and similar varieties fail to yield satisfactory crops.

This change in the varieties of sugar-cane planted has been due to several causes but the main one which forced the hands of even such staunchly conservative planters as the late R. G. Duncan was the steady and almost universal spread of fungoid disease among the older varieties.

The first appearance of these diseases in a serious form was in 1894 when strange to say they were first noticed in a large batch of seedling canes at the Botanic Gardens. Almost simultaneously outbreaks were reported from several widely separated districts in the colony. The planters followed every suggestion which was made by the Kew authorities as well as adopting the precautions which were being tried in the West Indian Islands. This action was followed at first with much success and in the early part of 1897 the rind-fungus and root diseases appeared to have been brought under control. But the immediately succeeding years proved this to be erroneous and these diseases gradually spread to almost every plantation in the colony, working havoc among the Bourbon canes. The spread of disease was greatly accelerated and its evil effects accentuated by the disastrous droughts of 1898, and 1899.

The exports of sugar fell off in round figures from 107,000 tons in 1896 to 100,800 in 1897, 96,600 in 1898, 84,800 in 1899 and 94,700 in 1900. The more favourable seasons of 1901, 1902, and 1903 were accompanied by a steady decrease of the damage done by disease and the export increased to 105,700 120,100 and 125,900 tons respectively. During these years the rind-fungus disease was increasing the area of its devastation, although it was not as virulent or destructive as it had been from 1897 to 1900.

The planters finding that every cultural method tried during this period had failed to check the spread of the disease, had resource to planting new varieties, firstly, the White Transparent obtained from Barbados, and later, as this cane gradually but surely succumbed to the attacks of root-fungus whilst its unsuitability as a ratooning cane on heavy clay soils became very marked, new seedling varieties produced in this colony and in Barbados.

The ravages of the root-fungus disease were noticeable during these years. Its earliest serious outbreak was on Windsor Forest in 1894-1895 but this was brought under control by the late R. G. Duncan placing the land which was infected under water and keeping it flooded for some months. The excellent results which followed on this gave a great impetus to placing old cane-lands under water as an ameliorant of their unsatisfactory condition.

In 1905 very extensive and virulent outbreaks of rind-fungus, again occurred, the most virulent being in the county of Essequibo

where the disease was due to *Diplodia cacaoicola*. On estates in this county the progress of the disease was exceptionally rapid; fields which one week looked green and full of promise in the next looked as if they had been ravaged with fire. One plantation the crops of which had been conservatively estimated at 2.1 tons of sugar per acre made only .9 ton. This outbreak compelled the owner of the estate to abandon the cultivation of the Bourbon cane and to plant new seedling varieties in its stead.

The following table gives some idea of the extent of the changes in the varieties of cane cultivated which the liability of the Bourbon cane to attacks of rind and root fungus has occasioned:—

For Crop of	BRITISH ACRES.		Seedling Varieties.
	Bourbon.	Older West Indian kinds other than Bourbon.	
1897 ...	73,000	(about) 750	(about) 600
1902 ...	70,710	2,040	4,100
1907 ...	40,105	670	33,665
1912 ...	23,520	40	48,250
1917 ...	10,660*	nil.	67,680
1918 ...	8,350*	nil.	69,475

*Mixed in part with other varieties.

The sugar planters during the 21 years under review have had difficulties other than droughts and fungoid diseases to contend with. Insect pests have been rife and have done great injury to their crops. During the whole of the period the smaller moth-borer (*Diatraea Saccharalis* F.) has always been in evidence and has greatly reduced the yield of the sugar estates. Its inconspicuous nature, however, has apparently prevented the majority of sugar estate managers and especially their field-assistants from realizing what a dangerous pest it is and the immensity of the losses it occasions.

In 1899 a new sugar-cane pest was reported as occurring on certain of the sugar plantations at Nickerie, Surinam. In the course of a few years it spread to British Guiana and from the forests behind the empoldered areas to the fields of sugar-cane and was then named the great moth-borer (*Castnia licus*. Drury). Its outbreak proved to be a blessing in disguise. It forcibly drew attention to the error which had been made in 1903 in depriving the colony of the services of a highly trained biologist at the time of the retirement of Dr. Evans from the Curatorship of the Museum. Two firms, Messrs. Booker Bros., McConnell & Co., and Curtis, Campbell & Co., combined together and induced Mr. J. J. Quelch to return to the colony to make a practical scientific study of the pest. The Government

realising that this outbreak would not be the sole occurrence of dangerous insect attacks upon economic crops in the colony, and that only the largest firms of sugar estate proprietors could possibly afford to employ a well-paid expert, attached an Economic Biologist and instituted a biological, principally entomological, division, in the Department of Science and Agriculture. After the successful termination of Mr. Quelch's work with the great moth-borer Messrs. Booker Bros. & Co. re-engaged him for a special study of the smaller moth-borer and its parasites. They also engaged Mr. H. W. B. Moore, of the British Guiana Museum, as an expert field entomologist in connection with their plantations.

Mr. Quelch's efforts proved successful and the great moth-borer was brought under control whilst he worked out methods by which the injury caused by the smaller moth-borer can be greatly reduced. The Government Biologist is in almost constant request by the planters and by farmers as well as by others in connection with questions of insect control in the interests of sanitation; whilst the excellent work done by Mr. Moore is realised by every planter.

A very marked instance has recently occurred proving the value to the colony of a properly equipped and manned division of economic entomology. As you are all aware the great local food-producing areas of the North Western, the Pomeroon-Moruca, and the North Eastern Essequibo districts were attacked by vast swarms of locusts during the autumn of last year. The widely distributed areas affected by the locusts amounted to a total of approximately 250 square miles extending, but very irregularly placed, over a distance of 150 miles as the crow flies. Notice of this attack was received in Georgetown by post on the 23rd of July, at 8 a.m.; before noon the general plan of the steps to be taken against the locusts had been settled at the interview between the Governor, the Government Secretary and myself, and the Governor's sanction to the necessary expenditure obtained. During the afternoon cablegrams were sent out to the various West Indian Islands and to the United States to secure supplies of insecticides. Early next morning the Economic Biologist and his assistants left Georgetown for the affected districts to direct the campaign against the hordes of the pests. That campaign was highly successful—thanks to the ready co-operation of the great majority of farmers and especially of the Aboriginal Indians in the infested areas. There may still be a few small swarms at large in the Essequibo and North Western Districts of the colony, but every large swarm has been destroyed. This most threatening outbreak was brought under control in the course of a few months at a net cost of \$2,038.60 as compared with that of approximately \$26,000, the expense incurred in dealing with the Berbice outbreak over an area of 25 square miles of fairly closely cultivated country in 1886. The difference in the cost of fighting the two outbreaks is more than the total expenditure on the Biological Division since its inception in 1911.

To return to the subject of new varieties of sugar-canes. In 1897 investigators generally were of the opinion that once a new variety of sugar-

cane was produced that after its first period of excessive vegetative vigour had passed its characteristics were fixed for all time. Soon after the cultivation of the new varieties had been extended over large areas it became painfully evident to the majority of planters that their characteristics are not fixed and that in many instances characteristics which in the earlier years promised to make a variety of sugar-cane of high value both in field and factory, were the first to fail. This tendency towards senile degeneration renders it necessary to raise new varieties of seedling canes year after year in the hope of having fairly good varieties available to replace others which may gradually fail.

Experience has proved to us that it is very easy indeed to raise new varieties of sugar-canes which are of high promise as plant-canes. It has further proved to us that it is relatively difficult to obtain sugar-canes capable of producing good crops as plant canes and as first ratoons; and that it is exceedingly difficult to produce varieties which can be relied on to give satisfactory crops of plant canes, 1st, 2nd, and 3rd ratoons. Few indeed of the enormous numbers of new varieties which are now raised each year in various parts of the tropics, will do this and the problem of getting good varieties for cultivation under the long-ratooning system necessitated here by our deficient labour-supply and dependence on hand instead of on mechanical cultivation becomes an exceedingly difficult one. Elsewhere with the exception of Cuba sugar-canes are as a rule only cultivated as plants or as plants and 1st ratoons. Hence as the best varieties raised in Barbados, Java and Hawaii have been chosen for their suitability for short ratooning periods it is rarely that a sugar-cane suitable for our long ratooning conditions can be imported from elsewhere.

The most successful method we have tried here for raising new varieties of sugar-cane of promise is based on the facts that a sugar-cane for successful cultivation on our heavy clay soils must be of well marked vegetative vigour and that the range of variation in the saccharine content of seedling sugar-canes is very great, its relative sugar-content being a fairly fixed characteristic of any variety. We endeavour to raise as many seedlings as we can from varieties of proved vegetative vigour and select from them those having both well marked vegetative vigour and relatively high saccharine content. By this method we raised from D 625 the seedlings D 118 and D 419, the areas under which have increased from 2 acres and 1 acre respectively for the crop of 1911-1912 to 2,710, and 1,360 acres respectively for this year's reaping.

We have been advised time after time to give up our proven methods and to confine our efforts towards raising canes by cross-fertilisation. If we had in this colony sugar-canes of single parentage showing fixed characters and through their purity of origin having little or no tendency to mutation or sporting that advice would be excellent. In India and to a less extent in Java sugar-cane varieties of high purity of strain

exist; and with these it is possible that by the application of Mendelian principles in raising seedlings, new varieties of high value may be obtained. Up to the present however, this has not taken place.

At the inception of the sugar-cane breeding work here Jenman was enthusiastic over the possibilities of raising new varieties of high promise by controlled methods of cross-fertilisation; but in 1892-93 our hopes in that direction received a severe shock. Using a variety of sugar-cane, the Kara-kara-wa cane, which our experience in three preceding years had shown to produce seedling-canes having usually somewhat close resemblance to the parent variety, and placing it under conditions by which it was impossible for its arrow or flowering shoot to be either cross-fertilised by any other variety or fertilised by any other flower shoot of its own kind, we got seedling canes from the one arrow of 267 different sorts. The parent cane in its own seedling stage was hence possibly derived from 14 diverse ancestral strains.

Supposing for example that we take two kinds of sugar-cane, one X having as ancestral kinds the varieties A, B, C, D, E and F and the other Y derived from its ancestors A, B, G, H, I, and J, it is evident that 406 different combinations can arise from the interbreeding of the two kinds, instead of a single blend or cross $X \times Y$.

By Mendelian segregation the inheritable properties of this diverse progeny will fall into three groups. We do not know which properties are inherited; but assuming that the general characteristics as a whole are heritable the segregation of the seedlings from the cross X and Y may give rise in the first generation to 1,218 groups of varieties.

Now either X or Y by interbreeding with its own kind could produce only 15×3 groups or 45 general strains of sugar-canes. The complexity introduced by the cross-fertilisation of existent complex hybrids is well illustrated by this example.

Up to 1902 we had not made any systematic attempt at raising canes of controlled parentage. We now do it as a matter of regular routine—not with any idea of getting seedlings having definite and desired characteristics but as a means of greatly widening the range of their variation. We have complete proof of the success of the method in this line. Unfortunately there is no chance in British Guiana of controlled cross-fertilisation of the sugar-cane proving a short and certain way to success in the production of new varieties of high saccharine value.

Probably a more disappointing investigation has never been pursued than has been the search for improved varieties of sugar-cane. There are now many stations at work at it in the tropics and sub-tropics; their results appear to be very similar;—in the earlier years working with natural varieties of sugar-cane several kinds of high promise are almost invariably obtained; in later years, when the mass of material for parental purposes has rapidly and enormously increased, the production of really good varieties appears to become increasingly difficult and results satisfactory

to both investigator and planter tend to be few and far between. It looks as though the good results arose from the unravelling of the complex ancestry of the natural varieties, whilst similar results from the re-tangling of the new strains thus obtained are comparatively rare and are very elusive.

The practical aspects of the position with regard to the favourite varieties of sugar-cane are shown in the following :—

Areas on Sugar Plantations for the crops of 1917 and 1918.

				British Acres :	
				1917.	1918.
D 625	...	...	...	37,800	36,000
Bourbon pure	...	...	...	7,400	4,950
Bourbon mixed	...	...	...	4,260	7,800
D 145	...	...	...	6,170	5,920
B 208	...	...	...	5,040	4,550
D 118	...	...	...	1,630	2,710
D 419	...	...	...	1,250	1,370
Green Transparent	...	...	...	1,500	1,320
Diamond 185	...	...	...	1,430	1,120
Java Seedlings	...	...	...	300	630
Providence 8	...	...	...	130	430
B 376	...	...	...	150	350
D 109	...	...	...	880	320

The distributions in percentages of the total area are :—

For crops of 1917 and 1918.

				1917.	1918.
D 625	...	...	...	48.2	47.9
Bourbon alone	...	...	...	9.5	6.4
Bourbon mixed	...	...	...	5.4	10.2
D 145	...	...	...	7.9	7.7
B 208	...	...	...	6.4	5.9
D 118	...	...	...	2.1	3.5
D 419	...	...	...	1.6	1.8
Green Transparent	...	...	...	1.9	1.7
Diamond 185	...	...	...	1.8	1.5
Java Seedlings	...	...	...	.4	.8
Providence 8	...	...	...	.1	.5
B 376	...	...	...	.2	.4
D 109	...	...	...	1.1	.4
Other varrieties, unenumerated or not returned	...	...	...	13.4	11.3
				100.0	100.0

The places of origin of the canes at present under cultivation in British Guiana are as follows :—

	1917.	1918.
Places of origin unknown		
(Bourbo and other old varieties)...	16.7	13.0
Java ... ..	.4	.8
Barbados	7.1	6.7
British Guiana, Plns. Diamond and		
Providence	2.7	2.6
" " Botanic Gardens ...	73.1	76.9
	<hr/> 100.0	<hr/> 100.0

In and prior to 1897 it was generally assumed that the manurial requirements of all varieties of sugar-cane were similar ; although the experience of certain planters in Barbados in the late eighties had shown them that the White, Purple, and Ribbon Transparent canes required, and made use of, higher dressings of sulphate of ammonia and of nitrate of soda per acre than could be safely and economically applied to the Bourbon. In 1901 a new departure was undertaken, the manurial requirements of each promising variety of cane being enquired into. A system was evolved during the next few years by which manurial experiments were merged into and became part of the scheme for raising and testing new varieties of sugar-cane. Each year the manurial requirements of a considerable number of varieties are being ascertained. The demand for phosphates appears to be very similar among all the varieties under trial up to the present. (over 100). It is not possible on our heavy clay soils to determine the demands of the varieties for manurial potash. On soils containing proportions of potash lower than our experimental fields do, without doubt the varying requirements of the different kinds for manurial potash is of high importance and may prove to be the governing factor, second only to nitrogen, in their sugar-producing power. The demand for nitrogen and the power that various kinds of canes have for its utilisation have been proved to differ very markedly.

Planters do not always realise that their work lies in utilizing the nitrogen available in soil, rain and especially in manures in the conversion of the carbonic acid gas of the air into sugar and thus that the power of various varieties of canes to do this is to them a matter of the utmost importance. For instance under the usual climatic conditions here, one ton of sulphate of ammonia under ordinary conditions of cultivation and of factory recovery when used with certain varieties of sugar-cane can produce commercial sugar at the following rates :—

CANES.	SUGAR. Tons.
D 419	5 to 6
D 625	4 " 5
D 145	3½ " 4½
D 118	3 " 4
Bourbon prior to 1897 ...	6 " 7
Bourbon 1897 onwards ...	3 " 4
B 208 and similar varieties ...	2 " 3

The latter varieties are unsuited to cultivation on very heavy clay soils under conditions of oft-repeated ratooning.

One ton of nitrate of soda under favourable conditions produces one-fifth less sugar than does a ton of sulphate of ammonia, but in practice it is safer to assume it will produce a third less. When used on land long-manured with sulphate of ammonia a change to nitrate of soda may prove to be beneficial and the yield of sugar may approach or even exceed that normal to the nitrate of soda when used under favourable conditions

It is probable that during this year the colony will be about 4,500 tons short of sulphate of ammonia or of its equivalents which means that its crops will be probably 20,000 to 25,000 tons of sugar less than they would be under normal conditions. This position should be strongly represented to the Government of Canada. If that country cannot supply us with sulphate of ammonia or its equivalent we shall be unable to supply it with sugar.

During the many year manurial experiments with the sugar-cane have been in progress in British Guiana practically every available commercial substitute for sulphate of ammonia has been under trial. The only ones which have not been tried are cotton-seed meal and castor-seed meal. The average efficiencies as compared with sulphate of ammonia taken as 100 of equivalent quantities of nitrogen in the various manures we have tried are shown in the following statement:—

Dissolved Peruvian guano	...	...	103
Sulphate of Ammonia	...	...	100
Nitrolim	...	...	97
Nitrate of Potash...	...	...	94
Nitrate of Soda	...	...	92
Dried Blood	...	...	90
Raw Chinchas guano	...	...	88
Lofoten Fish Guano	...	...	85
Nitrate of Lime	...	...	80
Animal Products Manure	...	...	60
Stable Manure	...	...	35

Our planters and farmers will do well to turn their attention towards substitutes other than purely nitrogenous products for sulphate of ammonia. The practical ones are :

- (a) The use of slaked lime in dressings of not less than 2 tons per acre.
- (b) The utilisation of the colony's vast production of rice-straw.
- (c) The use of legumes or pulses as cover-crops.

(a) On new land or on land long-rested from cultivation in sugar-cane, dressings of from 2 to 3 tons of Barbados "white-lime," or better, if procurable, of from 1 to 1½ tons of Trinidad quick-lime allowed to become air-slaked before application to the soil, should largely increase the yield

of sugar-cane. On such lands the results of the application of the lime should be equivalent in the first crop to those of a dressing of 200 lbs. of sulphate of ammonia per acre whilst for several years the lime will result in larger, but gradually decreasing crops. Planters must decide whether they will apply lime to their soils by consideration of the relative cost of sulphate of ammonia and of lime landed here together with the much greater cost of applying the latter to their fields.

(b) The colony possesses a vast store, some 200,000 tons a year, of rice-straw, much of which should be utilisable as a mulch or a manure. I believe that the use of rice-straw as a mulch on the fields of young canes to be later forked in between the banks will result in increased yields of sugar—possibly from the first year's application of not more than a ton to 2 tons of stripped canes per acre but that this will increase from applications in successive years to perhaps as much as 5 tons of sugar cane or, say, 8 cwts. of commercial sugar per acre.

It is certain to my mind that the skilled application and forking in of rice-straw year after year will greatly ameliorate the texture of the heavy clay sugar-cane lands and increase their productive power. Here again the planter must calculate the cost of the application as compared with the probable value of its ameliorant action.

(c) It is commonly assumed that the sugar-planters of British Guiana ignore and have always ignored the advantages they are assured they must obtain if they plant legumes as an ameliorant for the soils. The great majority of us have forgotten, even if we ever knew, about the large scale trials made in 1896 and 1897 with Bengal beans and other pulses. Most careful trials were made by some of our then most advanced and experienced planters. In many cases the beans grew well, so well and luxuriantly in fact that they killed off all weeds and all stray sugar-canes which were growing in the fields the beans were sown in. The trials were instituted and arranged by the late Mr. R. Bird of Mauritius who visited this colony for that specific purpose.

The growth of the beans was all that could be desired and there appeared a certain prospect that a completely successful substitute for manuring with sulphate of ammonia had been obtained. Difficulties, however, arose with regard to cutting-down and burying the great mass of vegetation on the fields. Sulphate of ammonia was then cheap, costing probably about \$65 per ton locally. It was found that it cost far more to produce, cut-down and bury 67 lbs. of combined nitrogen in the legumes than 67 lbs could be bought and applied in the form of 3 cwt. of sulphate of ammonia per acre. In addition the 67 lbs of nitrogen in organic combination in the legume foliage was not as effective as a sugar-producer as was 45 lbs. applied in sulphate of ammonia.

Other less vigorously growing legumes such as alfalfa were tried but also failed. Trials were repeated inoculating the soil with the specific organisms found in the root-nodules of vigorously growing alfalfa. Again

complete failure followed. Hence only vigorously growing beans of various strains could be used ; and with them, whether Bengal beans, Woolly pyrol or velvet beans were used, the results were the same. The costs of cultivation and application were too high in comparison with the then price of sulphate of ammonia for their practical utilisation.

Owing to the great appreciation of sulphate of ammonia this may not now be the case. Trials on the large scale should be resumed. Probably the solution of this problem will be found in mechanical tillage. The system to be followed should be to grow the kind of beans which are found to give the heaviest returns of foliage, to cut down the mass of foliage, to leave it on the land for a short time to wilt, and when it has wilted sufficiently to be easily handled, to plough or fork it in.

Now there is a very common error with regard to leguminous cover-crops. It is assumed that they are always successful in increasing the nitrogen in the soil. To obtain good results you must bury, or otherwise apply to the soil the *whole* of the produce. If you gather the seed and use it for food or other purposes you take from the produce the greater part of its accumulated nitrogen. Still by burying all the residues after reaping the seed a certain but small proportion of the nitrogen accumulated by the pulses is left in the soil. But if the whole of the produce other than the seeds is removed from the field and not returned to its soil, leguminous crops are practically as exhausting to the soil as sugar-cane can be.

Again the successful cultivation of leguminous crops requires larger supplies of available phosphates and potash in the soil than do that of the sugar-cane and similar crops. Hence it may be necessary and it always will be advisable, to apply to lands which are to be planted with legumes either superphosphate of lime or slag phosphate. Most of our coastland soils are very plentifully supplied with potash.

Any planter or farmer who commences the cultivation of legumes for cover-crops must be prepared to meet with disappointments. Not unfrequently for reasons which are not obvious the legumes will refuse to grow. We have had an instance of this in our experimental work when we planted legumes time after time on certain soils with the result that the young plants either wilted and died when quite small or if they survived for a time could not hold their own against ordinary weeds. We left the land for some months in a condition for which we were severely criticised by self-constituted agricultural experts ; we cut down and buried the very luxuriant crops of weeds we obtained and on replanting the land with beans we finally obtained very heavy crops of the pulses.

The high proportion of legumes which occur among the weeds in this colony is very remarkable. Here I have to include the non-utilised

trees of our forests among weeds. Leguminous trees are of very common occurrence in our forests and any one who traverses any of the small creeks which meander through them may notice the enormous number of root tubercles or nodules present on the rootlets of vast forest trees which have fallen on the banks of the streams. Similarly on abandoned lands and especially on lands resting from sugar-cane cultivation legumes are prominent among the weed-flora. Nature ever kind but apt to be too profuse in her kindnesses to this colony ensures the conservation of fertility on our abandoned or neglected fields. Cultivators, however, should take advantage of this by cutting down the weeds, allowing them to wilt and then forking them into the soil.

These three methods of countervailing to some extent the scarcity of nitrogenous manure have each the merit of ameliorating the composition and textures of the soil and thus their effects are not limited to one crop whilst in the cases of application of rice-straw and of that of leguminous cover-crops the good effects are cumulative in their action. Personally I look upon the utilisation of the rice-straw as a practical step which ought to receive the attention of the more enterprising among the planters.

I noticed a few days ago in a local newspaper allusion to the scarcity of potash for manurial purposes. Fortunately our sugar and rice lands are very rich in potash while cultivation sets free from such soils potash in quantity far in the excess of the requirements of any tropical crops. For instance the top-most acre-foot of the heavy clay soils of the Botanic Gardens contains not less than 80 tons of potash, equal to 160 tons of commercial sulphate of potash, per acre. 18 tons of this is soluble in hot strong hydrochloric acid, one ton being dissolved by slightly acid water; $\frac{2}{5}$ of a ton is in what is usually regarded as the condition in which it is immediately available for plants and of this, potash, equal to 7 cwt. of sulphate of potash per acre, is soluble in pure water. There is not any likelihood of manurial dressings of sulphate of potash having any effect on such soils, nor of their requiring them for many years to come.

This condition extends a long distance from the coast on the river alluvial soils but is non-existent on the soils of the interior which are as a rule abnormally deficient in potash. The West Indian sugar islands may suffer from shortage of manurial potash salts but some recent geological analyses I have made for the Commissioner of Agriculture for the West Indies indicate that the potash-containing mineral "alunite" exists in certain of the volcanic islands.

HUMUS.

A question which has received much attention at intervals since 1897 is that of the importance of the organic constituents of soils frequently but incorrectly lumped together under the head "humus."

At present probably few of the constituents of soils are receiving such intensive investigation as these are. To some agriculturists "humus" appeals as the dominant agent in the fertility of soils; to others its degradation-products are regarded as most dangerously inimical to crop-production. The probability is that neither of these extreme views is the correct one; decomposing vegetable-debris is of high importance agriculturally whilst the final degradation-products to which the dark colour of certain soils is largely due are, as far as our investigations during the last 21 years show, either practically inert or possibly may be injurious. The productivity of Demerara clay soils certainly is not governed by their proportions of the dark-coloured, alkali-soluble, vegetable decomposition-products to which the term "humus" should be strictly confined, and hence the fact that many of our soils are light-coloured does not supply any justification for the wholesale condemnation, as has been recently done, of our sugar estate managers as being unscientific, unskilled, unpractical planters.

In a paper I read in November, 1886 before the Barbados Agricultural Society was the following:—

" A most important point also, and one which I can scarcely impress upon you too strongly, is the very great mechanical improvement in the condition of the soil produced by pen manure and by vegetable green manures. The soils heavily manured with these become much more retentive of moisture which is a most valuable property in our climate, whilst the addition of the very large proportion of organic matter contained in the manures increases the amount of 'humus' in the soil; and, as the activity of the nitrifying organisms present (both those which oxidise ammonia into nitrates, so preparing it for plant-food, and those which possibly occasion the assimilation of the free nitrogen of the air) depends in great measure upon the amount of this substance present, which apparently acts as food for them, the importance of such increase is evident."

The earlier parts of this statement are as appropriate now and to this colony as they were in 1886 to Barbados, whilst if for the word "humus" the words "vegetable debris" are substituted in the latter part this becomes equally applicable, and thus the conclusions stated are of great importance to us at the present time.

One of the first things which strike a cursory agricultural or scientific visitor here is what appears to be the absence of "humus" on our front lands. Although humus in the strict sense of the term may be present only in relatively small proportions, yet the far more important plant-debris which do not necessarily darken the soil may be present in some abundance. Such a visitor is apt to explain the light-coloured condition of the soil by an assumption that the planters have by defective methods of cultivation and soil-conservation caused the depletion of the soil in plant-residua. A visit to some newly cleared very fertile river-lands might

change this view. He would there find that with the exception of a very thin layer of dark-coloured earth covering the land the soil is light grey to almost white in hue.

That light colour indicates a former, if not a present, abundance of plant-debris. During the rapid decomposition and oxidation of such debris, organic acids, including carbonic acid, are produced and the waters containing them leach-out from the soil the dark-coloured organic iron compounds which if present would tinge the earth dark grey to almost black. It is the superabundance, either in the present or in the past, of decomposing vegetable debris which results both on sugar-cane lands and on the river alluvial soils in the production of light-coloured to almost white earths.

The system formerly in force here on sugar estates, but which has been widely abandoned since 1897, of burying the trash, cane-tops, etc., between the rows of canes tended directly towards the conservation of plant-residua in the soil, but unfortunately financial difficulties, unsatisfactory labour and other conditions have compelled the planters to burn their canes prior to reaping them. This system naturally interferes with the accumulation in the soil of plant-residua.*

Two methods of assisting in the amelioration of the soil by addition of plant residua have recently been advocated but not by agriculturists resident in the colony. In the first it was proposed to add to the soil forest leaf-mould. Now to add plant-debris to the soil to the extent of one-half of one per cent. of the upper surface layer of the soil would require the addition of 15,000 lbs. of such debris per acre and that would entail the application of at least 37,000 lbs., probably of 50,000 and possibly of far more of forest leafmould. Some time ago for another purpose I ascertained that under heavy forest at Issorora, North West District, the *wet* fallen leaves over an acre of land weighed only $6\frac{1}{2}$ tons. It would take all such fallen leaves from three acres of forest land to dress the soil of one acre of caveland with the equivalent of a relatively light dressing of organic debris such as is furnished by farm-yard manure.

Application of pegass dug from the land at the back of the plantations to the canefield has been also suggested. As a tentative proposal at first sight it appears a very practical one, but when it is remembered that the nitrogenous and other agents of soil fertility; present in pegass are in a condition of extreme insolubility and hence non-availability and that pegass

* Under our former system of agriculture probably from 25 to 30 per cent. of the nitrogen in the cane, 66 per cent. of the potash, and 45 per cent. of the phosphoric acid were returned to the soil by the tops and dry leaves. There was, therefore, little chance of the exhaustion of the soil by continued cropping, except of the immediately available nitrogen, which was then easily and cheaply supplied in the form either of sulphate of ammonia or of nitrate of soda. A very large proportion of the great quantity of vegetable matter conserved to the soil under the former system is now, under the system of burning the canes, entirely lost; almost all of the combined nitrogen is lost whilst the potash and phosphates of the vegetable matters are rendered more or less insoluble, inert, and useless for the production of later crops.

contains a very great quantity of soluble peaty compounds which are plant-poisons it is evident that, as I have known them to do in practice, applications of heavy dressings of pegass will result in the reduction of immediate fertility with little, if any, promise of future increment. Pegass requires to be materially altered in composition before its constituents become available as soil-ameliorants and as plant-food. It must in fact be first converted into "bacterised peat."

To my mind it is futile to discuss such methods whilst we neglect that very practical and immediately available one of mulching the canelands yearly with heavy dressings of rice-straw.

FLOODING THE LAND.

During the period under review this excellent mode of ameliorating the soil has come into vogue. Instituted by the late R. G. Duncan at Windsor Forest in 1894-5 for the destruction of root-fungus and various insect pests of soil and sugar-cane (it had been earlier in use on sugar-plantations in Surinam) the excellent results which ensued have caused it to be widely adopted. Its action appears to be a complex one.

During the time the land is under water the organisms causing root-fungus disease of the sugar-cane are destroyed, and so are numerous insect-pests which have their habitat in the soil, on sugar-cane debris, and on weeds; oxidation of certain soil-constituents becomes far more active and is possibly at its maximum owing to the surficial growths on the water of certain algae and bacteria; the salts which have accumulated in the sub-soil during long-continued sugar-cane cultivation are largely removed in solution in the water used for flooding; whilst the general texture of the soil is very greatly improved. Possibly the adoption of this system is among the most important agricultural innovations during the period under review. It is not, however, as practised here as successful from a financial point of view as it might be. Why should the land be allowed to lie fallow during the period of flooding? Just as good results will accrue to the soil if it bears a crop of rice as if it is fallowed. Planters should make use of the Java system. Flood the land, but do not leave it idle; whilst this is taking place rice should be grown. Flood the land, raise one or two crops of rice, insisting that all rice straw, etc., be left on the land or on the meres; plough up burying the residua of the rice crops, and replant with sugar-cane. This should result in crops of possibly three or even four tons of sugar per acre.

This system however cannot be widely adopted until there is a means of economically tilling the land. In fact the amelioration of the sugar-cane lands of the colony cannot be brought about either by raising green leguminous dressings, applying rice-straw in large quantities, or by a rotation with rice on flooded lands until mechanical appliances for deep tillage and possibly for subsoiling the land are economically available. Personally I have not the slightest doubt that mechanical deep tillage and subsoiling will greatly assist the beneficial effect of flooding the land.

MECHANICAL TILLAGE.

In the earlier days of this Society much attention was directed by it towards problems of mechanical tillage. Some, but far from sufficient, attention has been given to this problem during the past twenty-one years. The late Mr. T. Wardle, of Washington rice farm, was an earnest and persistent advocate of mechanical tillage; I fear that his untimely death may have kept back progress in that direction. Success in it will be followed by greatly increased prosperity in all agricultural pursuits in which it becomes available; whilst mechanical tillage should go far to relieve the present unfortunate labour-position, a position which in all probability will become far more acute during immediately succeeding years. It is a subject worthy of public discussion at special meetings of this Society by planters, farmers and engineers.

LIMITING FACTORS FOR SMALL SCALE EXPERIMENTAL ENQUIRIES.

Trials of new varieties of sugar-cane for their cultural and especially factory merits; modes of practical control of fungus and insect pests; flooding the land; mechanical tillage; and certain other cultural procedures known to every planter cannot be successfully tried-out on small scale plot-experiments such as we are at present limited to. Scientifically conducted enquiries into these require large areas of land worked under estate conditions. The Government has not any land available for such trials; nor has it the technical staff necessary to carry them out. These enquiries are, or rather should be, the work of co-operative agricultural stations financed and solely controlled by the proprietors of sugar estates. Such a station appeared to be in sight as a practical proposition during the earlier months of 1912 but that fatal lack of co-operation among the proprietors of sugar-plantations in this colony which has so long been its bane proved too strong for those who endeavoured to bring the inception of the station to a practical issue. Until co-operation in such enquiries as I have mentioned is an accomplished fact here I am satisfied that very little progress will be made in British Guiana in the improvement of cultural methods with the sugar-cane. Surely such co-operation is not impossible. Its inception ought to be one of the main objects of this Royal Agricultural Society.

Another stumbling-block in the progress of the sugar-industry during the period under review has been the extraordinary desire for secrecy with regard to the details of factory work. This cannot, I fear, be due to modesty for few indeed of our factories now are capable of results which can compare at all favourably with the economical output of sugar of factories in Hawaii, Java, Louisiana, Cuba, Porto Rico, Formosa, Trinidad, St. Kitts, Antigua, or even of the small centrals in Barbados. Is it that the managers fear to let their neighbours know the cause of their failures? Surely far more harm is being done by the failures than could possibly be done by knowledge of how they have occurred and how to prevent them in future. It is, I believe, an absolute certainty that all-round improvement in factory methods and practice would ensue

through mutual co-operation, consultation, comparison of results, and discussion. The remarkable secretiveness of the planters in British Guiana, more especially those of the counties of Essequibo and Demerara has been, I fear, responsible for some, at any rate, of the stagnation which characterises the local sugar-industry. In the sister county of Berbice this secretiveness has not been so much in evidence and when I used to visit planters in that county I found that the managers of the successful plantations—Port Mourant, Albion, Rose Hall, and Blairmont—were not averse to mutual discussion and to working together with a view to increasing the efficiency of their work and thus to the benefit of their employers. I trust that this will there continue and will extend to the other counties.

Why the planters of this colony have not adopted the mutual factory control system in use in other cane-sugar producing countries is a mystery to me.

Of course there have been other and possibly far more serious causes than lack of co-operation which have been detrimental to the progress of the sugar-industry here. In 1897 our sugar-factories on the whole were perhaps as well or even better fitted than the general run of similar factories in other progressive cane-sugar producing countries, but since that year many of our factories perforce have been more or less neglected, have deteriorated in efficiency, and have fallen in their equipment, some of them hopelessly, behind the times. The great majority of the men in charge of the sugar-plantations in 1897 were far-sighted men of marked initiative power. But unfortunately the disappointing nature of the report of the Royal Commission as regards the abolition of the sugar bounties with the fact that there was no chance open to our sugar-industry of competition on terms of equality with German bounty-fed beet-root sugar caused the majority of the proprietors of sugar estates to adopt a policy of reduction of expenditure—they had to follow the unwise and undesirable course of attempting to make money only by saving money, whilst trying to live on the bare interest of their ever-decreasing capital. They have not been in a position to give practical effect to lessening the costs of production by improvements in equipment and in agricultural methods, and hence the sugar-industry has suffered greatly.

AREA IN THE BRITISH GUIANA SUITABLE FOR SUGAR-CANE CULTIVATION.

In 1914 the various agricultural associations and authorities in the sugar-cane producing colonies were asked to prepare statements as to what room there is in the respective colonies for the extension of the sugar-industry. The following are extracts from reports which were prepared in the Department under my charge and which extracts it may be desirable to place on record in the pages of the Journal of the Royal Agricultural and Commercial Society of British Guiana :—

EXISTENT SUGAR ESTATES.

“72,527 British acres equal to 44·7 per cent. of the empoldered area, 162,139 British acres, of the sugar estates are under sugar-cultivation. About 85% of this acreage is reaped each year indicating that in round figures 38% of the empoldered land contributes to the yearly production of sugar. The average production of sugar over the Colony during normal years is about 1·8 tons of sugar per acre reaped. On well-administered, suitably equipped and satisfactorily financed plantations the average in favourable years may be taken as from 2·1 to 2·2 tons of commercial sugar per acre reaped per annum. On the best estates, such as Plns. Wales, Diamond, Port Mourant, and Uitvlugt in really good years the yields are higher.

“The export of sugar during the year 1914 was 107,138 tons. The British Guiana Planters' Association states that with the existing labour-supply the area at present under sugar-cultivation is capable of yielding 126,000 tons of sugar per annum. The Association also states:—“The land on the Estates that is not cultivated at present, is estimated to be capable of giving a return of 101,800 tons of sugar per annum.

“This shows that given an ample supply of labour the return from the empoldered areas of the present sugar-estates could be increased to, in round figures, 228,000 tons of sugar per annum.

“It is doubtful if, even at present prices, the acreage under sugar reaped each year on the empoldered lands could be economically increased to more than 50% of their area. If it were increased to that extent the crop of sugar might amount to, in round figures, 145,000 tons, the mean yield being taken as 1·8 tons of sugar per acre.

NOTE.—The following testimonies to the planters of 1897 and their immediate predecessors appear in the Report and the Subsidiary Report of the West Indian Royal Commission :—

“It is only just to say that the planters in Guiana have not been behindhand in efforts to improve the cultivation and the manufacture of sugar, and that their efforts have been attended with remarkable success. The amount of sugar and rum produced has been well maintained, and the cost of production has been greatly reduced. If it had not been for these efforts, and for an expenditure on machinery which during the last fifteen years has amounted to £1,307,500 the sugar industry must have succumbed.

“Sugar is undoubtedly the staple production of British Guiana. The industry is carried on with considerable energy and intelligence. The maintenance of an elaborate system of drainage, the skilful cultivation of the soil, and the high character of the processes of extraction and manufacture place British Guiana amongst the most progressive of the cane-sugar producing countries of the world. It is estimated that cane-sugar of high quality can be produced almost as cheaply in British Guiana as in most tropical countries.

“In conclusion it may be assumed that as regards the general suitability of the soil for the cultivation of sugar-cane, as regards the methods of cultivation and manuring pursued during the last 15 years, and as regards the character of the machinery and skill devoted to the manufacture of sugar, British Guiana occupies a high position as compared with other cane-growing countries.”

OTHER AREAS IN DISTRICTS WHERE SUGAR-CANE HAS BEEN CULTIVATED.

“A conservative estimate of the area of lands well-suited for sugar cultivation in the districts from the mouth of the Pomeroon in the

"north-west to the west bank of the Corentyne river in the east is 531,000 acres exclusive of the area already empoldered on sugar estates. Sixty-four thousand acres of this may be at present beneficially occupied by products other than sugar leaving 467,000 acres available for the extension of sugar-cultivation. At the present proportion of land yearly cropped with sugar to the total empoldered area this would give in round figures 177,000 acres to be reaped each year yielding a mean annual crop of 320,000 tons of sugar.

"If 50 per cent. of the area (233,500 acres) were reaped each year the yield would be, in round figures, 420,000 tons.

"If the proportion of the area cultivatable in sugar-cane were similar to that indicated by the Planters' Association as so cultivatable on the empoldered sugar estates its annual possible yield of sugar would be increased to 580,000 tons.

"The possible annual crop of sugar in districts in British Guiana where sugar-cane has been cultivated could with sufficient capital, labour, progressiveness and enterprise be increased to 446,000 tons of sugar as a minimum; to 563,000 tons if 50% of the land was yearly cropped or by utilising the highest possible proportion of the suitable lands for cultivation to upwards of 800,000 tons, which by fully applying modern scientific methods in cultivation and manufacture might be increased to upwards of 1,000,000 tons.

"The enquiries as to the amount of sugar produceable by the existing labour-supply are very difficult to satisfactorily reply to. What proportion of the labour-supply will work on the production of sugar? The present production is largely limited by this. It is also limited by the energy, the enterprise, and the progressiveness of the proprietors; their willingness and ability to make use of mechanical cultivation wherever feasible; by the progressiveness, both agriculturally and mechanically, of the managers of the estates; by their knowledge of, and their application of such knowledge to, problems of selection of varieties, manuring of plants and control of fungoid and insect pests. The productive power of a labourer is governed not solely by his industry but also by the capital and the brain-power of his employers and by their ability and willingness to supplement his labour by the most efficient mechanical appliances. A labourer may produce 2 to 2½ tons of sugar a year where capital, progressiveness, and ability are not conspicuous in his employer; he may produce 5 to 6 tons where these are present in a marked degree; whilst he may produce 6 to 8 or even more where those directing his work have and utilise all possible advantages of capital, modern appliances, and agricultural and administrative ability.

"The sugar-producing power of any well-cultivated area of land on the maritime districts of the colony is directly governed by the supply

"of sulphate of ammonia. Without it such land may yield $1\frac{1}{4}$ to $1\frac{1}{2}$ tons
 "of sugar per acre ; with it the same land may yield from $2\frac{1}{4}$ to $3\frac{1}{2}$ tons,
 "the labour employed being the same."

By special direction the enquiry was extended to cover the districts in the North Western coastlands of the Colony which have never been under cane-cultivation. Interest in its results is purely empirical as they do not come within the sphere of practical utility. The utilisation of lands in this area might possibly produce 1,500,000 tons of cane-sugar per annum but in my opinion as well, I believe, as in that of every one acquainted with the cultivation of the cane sugar industry in British Guiana this estimate is of the nature of a vision ;—characteristic of *Nephelokokkugia*.

I may mention that in forming the estimate of the area of land available for the extension of sugar-cane planting in the parts of the colony in which the sugar-industry has been carried on only alluvial lands to a mean depth of 2 miles from the coastal and river façades were taken into account and from the total of these the areas which in 1914 were under cultivation with products other than sugar-cane were deducted.

The earlier progress and later stagnation of the sugar-industry is illustrated in the following table :—

SUGAR CANE AND SUGAR QUINQUENNIAL PERIODS.

Periods.	Sugar-cane.		Sugar.	
	No. of acres (British) under cultivation.		Tons of sugar exported.	
1859-1863	...	No records		59,000
1864-1868	...	" "		75,330
1869-1873	...	" "		81,700
1874-1878	...	" "		99,940
1879-1883	...	81,270		103,860
1884-1888	...	80,690		113,820
1889-1893	...	79,630		110,900
1894-1898	...	70,640		101,620
1896	...	71,300		105,270
1899-1903	...	74,170		106,260
1904-1908	...	75,580		110,830
1909-1913	...	72,640		94,820
1914, 1915 & 1916	...	75,730		109,000
1917	...	77,828		114,000

THE RUM INDUSTRY.

The fermentation and distillation processes on the sugar-estates have been subject to, on the whole, little improvement during recent years.

They had been brought to a high state of efficiency prior to 1897, mainly owing to the scientific labours of Messrs. Scard and Douglas. At that time 76 to 78 per cent. of the theoretically possible yields of alcohol were being recovered in rum, a rate which fairly closely approximated to the best technical efficiency in the spirit industry—from 80 to 82%.

The number of distilleries has greatly decreased during the period under review. There were in 1896 fifty distilleries using pot or vat stills and seven using Coffey or other forms of continuous rectifying stills. There were in 1917 twenty-six distilleries using stills of the former type and ten using the latter. The export of rum in 1896 was 3,291,290 proof-gallons as compared with an average export of 4,167,000 proof-gallons during the years 1915 to 1917. It is evident from the figures given that although the actual fermentation and distillation processes may not have under-gone much improvement the economic and financial efficiency of the rum-producing industry has been markedly added to.

I may mention that in 1897 an excellently equipped spirit-refinery—the Black Distillery—was at work in Georgetown turning out from ordinary rum, spirits of an exceptionally high standard of purity, which after skilful flavouring were sold as factitious brandy, whisky, or gin in competition with the German-made or “Hamburg” spirits which until very recent years were largely imported here for sale at low prices. Whilst the processes in use at the Black Distillery were highly successful when applied to rum of originally well-marked purity, the distiller, over-estimating the efficiency of his process, unfortunately applied it to rum of very unsatisfactory character which it proved unable to deodorise and on account of this, among other reasons, the distillery ceased its working; with the result that now under war-conditions we have to be satisfied with the excellent rum produceable in the colony under its natural flavour and aroma.

MOLASCUIT AND OTHER CATTLE FOODS.

In 1897 the sole by-products of the sugar-industry were molasses and rum distilled from it, but a few years later Mr. George Hughes, F.C.S., introduced a process for the preparation from the molasses of the sugar-cane of a high-grade cattle-food. This food consists of a mixture of vacuum pan molasses with the finer particles of the interior spongy tissues of the sugar-cane, which are separated from the megass produced during the grinding of the sugar-cane. The mixture results in a dry, brown-coloured, coarse powder possessing a very fragrant and attractive odour. Its characteristic is the high proportion—72 per cent.—of its readily digestible constituents and especially the high digestibility of the fibre present in it. In some years during the period under review, the exports of cattle-food—Hughes' molascuit and modifications or imitations of it—have been in excess of 12,000 tons. War-conditions unfortunately have recently greatly reduced the exports of this important by-product.

Among the more striking, if not the most striking, of the agricultural developments in the West Indian Province during the 21 years which have elapsed since 1897 has been the very extensive rice-industry of British Guiana. In 1897 one of the most important steps ever taken with regard to that industry was completed by the erection, by the aid of a Government loan, of the pioneer large-scale rice-factory in Georgetown. In the Report of the West Indian Royal Commission issued towards the end of 1897 was the following :—

“Rice to the value of £180,000 was imported in 1895-96 for consumption in the Colony. Rice of excellent quality is already grown in British Guiana, and every effort should be made to produce locally all that is wanted of this article.”

Whilst in the Dr. Morris' Subsidiary Report was the following :—

“There can be no doubt as to the decided opinion which prevails that rice-growing is a most promising industry on the coast lands of British Guiana. The cultivation so far has been undertaken on comparatively small areas by coolies, and with very crude appliances for threshing and husking the grain. Recently a loan has been sanctioned by the Government for erecting and working one or more rice factories where the rice could be milled and prepared at a small cost for local consumption. The present cost of husking rice by hand-pounding in mortars is estimated at 3s. 6d. per bag. At well-equipped mills, this could be done at a cost of about 1s. 6d. per bag. It is confidently anticipated that as soon as mills are established, a great impetus will be given to rice-growing all over the Colony.”

The progress of the rice-industry since 1884 is shown in the following statement :—

Quinquennial Periods.

Periods.	No. of acres (British) reaped.	Rice exported lbs. per annum.	Rice imported lbs. per annum.
1884-1888	... (about) 2,500	Nil	43,500,000
1889-1893	.. „ 2,500	„	41,964,000
1894-1898	... 7,490	10,820	32,062,000
1896	... 6,500	Nil	32,913,000
1899-1903	... 15,020	6,000	18,127,000
1904-1908	... 29,500	3,769,000	5,644,000
1909-1913	... 37,750	10,177,000	355,000
1914, 1915 & 1916 (3 years only)...	50,270	21,769,300	20,100
1917	63,580	32,182,000	nil

The statement verifies in a most striking manner the views of the Royal Commission and of their able colleague and adviser Sir Daniel Morris ; 32,000,000 lbs. imported in 1896 ; 32,000,000 lbs. exported in 1917 !

The area under rice cultivation in 1896-97 was about 6,500 British acres yielding paddy equal to about 4,000 tons of cleaned rice in value about £48,000 or \$230,000, whilst in 1917 not less than 63,580 acres were reaped, yielding paddy equal to about 45,000 tons of commercial rice, having a value in normal times of at least £540,000 or \$2,600,000.

The yields of rice in the colony vary very greatly ; for instance, on empoldered lands with satisfactory facilities for irrigation and drainage the crops may be from 20 to 28 bags (of 140-150 lbs.) of paddy, the average yield on these lands being 25 bags per acre ; on non-empoldered lands with fair irrigation the yields are from 16 to 20 bags of paddy per acre, whilst on poor and unsuitable lands with defective irrigation or with no means of irrigation and dependent solely on the rainfall the yields are only from 8 to 14 bags per acre. Over the whole colony the average yields are from 18 to 23 bags per acre per crop, the yields being governed by the characteristics of the seasons.

In some districts, more especially in North East Essequibo, where facilities for irrigation and drainage are exceptionally favourable, two crops per annum are usually reaped. On the best empoldered lands the two crops yield a total of from 38 to 45 bags (140 lbs.) of paddy per acre, whilst on non-empoldered lands the total annual yields are from 30 to 35 bags.

Prior to 1897 several attempts were made with but little success towards improving the quality and yield of rice in British Guiana by importing seed-paddy from Calcutta. There were resumed in 1897 but failed as at that time the Botanic Gardens proper were used almost exclusively for ornamental and horticultural purposes whilst there was not any land available in the experimental section devoted to sugar-cane. In 1902 with the assistance of the late Sir Alexander Ashmore some marsh-paddies of choice varieties were obtained from Ceylon. An area of then practically marsh-land in the north-eastern section of the Botanic Gardens was cleared from bush and laid out in rice-beds under the direction of Mr. B. Gainfort, whilst acting as Superintendent of the Gardens. A year later supplies of hill-paddy were obtained but owing to "heating" on the voyage from Ceylon to here, the seed-paddy proved almost entirely non-fertile ; but Mr. R. Ward succeeded in germinating nine grains of the paddies and from them some good strains of hill-rice were obtained. Later supplies of seed-paddy have been obtained from several different countries and colonies and over 300 varieties have been under experimental field-trial. Few of them have been able to compete in yield and quality of paddy with the Creole rice of British Guiana as improved by careful and continuous seed and field selection. On these fields the yields of the Creole rice have increased from 35 cwts. per acre in 1905 to 42 cwts. in

1916 and to 41 cwts. in 1917. The best of the introduced varieties now only yields on the average about $1\frac{1}{2}$ cwt. of paddy per acre more than does the Creole whilst its former excess yields over the local kinds were from 3 to 4 cwts. per acre per crop.

From 10 to 12 tons of seed-paddy, 99% true to type, of the best imported and local strains have been distributed from the Botanic Gardens among rice-planters each year since 1907.

The average yields of rice per acre in British Guiana are fairly satisfactory, but the following table shows that whilst the colony occupies an enviable position among rice-producing countries with regard to this, a few others far exceed it and it is to their standards that rice-growers in this colony should strive to attain :—

CLEANED RICE.			
Cwts. per acre.			
Spain	...	...	26.
Egypt	...	...	21.5
Japan	...	...	21.5
British Guiana	...	...	15.0 to 19.0
{ Empoldered lands	...	...	16. to 22 }
{ Other lands	...	...	11. to 16 }
Italy	...	...	16.7
Formosa	...	...	15. to 17
Korea	...	...	11. to 12
Java	...	...	11.
United States...	...	...	8.6 to 12
Bornea	...	...	8.4
British India...	...	...	7.3 to 8.6
Malaya	...	...	7.3
Trinidad	...	...	7.0
North Borneo	...	...	6.3
Ceylon	...	...	4.4 to 5.6
Phillipine Islands	...	...	4. to 5

Our high yields may be due in part to the excellence of our local strains of rice, and in part to our facilities for irrigation ; but not in the same degree to excellence of cultivation. When it becomes feasible to cultivate the rice-lands more thoroughly the yields should increase to a considerable extent. We are favoured here in many places by the special suitability of savannah and creek waters for the irrigation of the rice fields, the high content of plant-food in the waters enabling the lands irrigated with them to produce heavy crops of rice year after year without showing any signs of falling-off in yield. Abandoned sugar-cane lands are especially suitable for rice cultivation owing to the impervious clay-pans which have formed in them at about 12 inches from their surfaces, and which tend to conserve the irrigation-water from loss by seepage ; and to the marked stimulus to the growth of the rice by the saline matter which has accumulated in the lower layers of their soils. Rain-water does not

result in such heavy returns of rice as does irrigation with creek-water whilst the yields from using artesian well-water may be even lower than from rain. Our trials during recent years have proved that artesian well-water must be applied to the land in a continuous flow, and not intermittently, as swamp or creek water is used. Where artesian water is employed the need of repeated tillage between the succeeding crops becomes very marked; our trials show that an additional thorough ploughing may increase the yields from 4 to 9 cwt. of paddy per acre.

It is possible to get 5 crops of rice in two years by using continuously flowing artesian well-water, the total yield of paddy thus obtained in our trials being 166 cwt. per acre or at the rates of $33\frac{1}{2}$ cwt. per crop or 83 cwt. per annum. During the same period two crops of rice were obtained on similar land using creek-water which together weighed 87 cwt. Thus although the crops obtained through the use of artesian water are not individually as high as those obtainable by the use of creek-water the total yields obtained by constant cropping may be much the greater.

I am satisfied that using artesian well-water with thorough tillage between the crops, four crops of rice can be obtained in two years weighing from 130 to 150 cwt., which yield would compare very favourably with the crops obtained by the double cropping system with creek-water in North East Essequibo where an average yield of about 96 cwt. of rice in two years and a maximum one of 120 cwt. is obtained.

There are still vast areas of potential rice-lands available on the front-lands of the colony and I think we may look forward with confidence to a time in the near future when we shall have, say, 100,000 acres cropped with paddy yielding from 75,000 to 80,000 tons of cleaned rice per annum.

It is usual to ascribe the success of the rice-industry solely to the East Indian section of the community. This is not strictly correct; its initiation was due to negro colonists; its early development on a small scale was due to the unaided efforts of the East Indians; its greater development has been due to the manner in which rice-millers and local capitalists have co-operated with and financially aided the East Indians in building up the industry on commercial lines.

I alluded earlier in this address to the great impetus which the establishment in 1897 of the pioneer, thoroughly equipped, rice-mill in Georgetown gave to the industry. There is now under inception by the Government the erection of a factory for producing flour from rice, pulses, corn or maize and similar grains. Its cost may be in the vicinity \$30,000. I think that that sum will be well invested and that British Guiana rice-flour may in the near future become a regular article of export to the West Indian Islands. At present there is a large amount of broken rice produced in the various rice-mills and it is hoped with suitable appliances to so thoroughly clean this by-product that it may be successfully converted into high-grade rice-flour.

COCONUTS.

If the colony had adhered to its old-time policy of having all its eggs in one basket its inhabitants would be, under present war conditions, in a very serious position indeed with regard to one of the most important constituents of their food supply—I allude to fat.

In the late seventies and early eighties some impetus had been received towards the cultivation of coconuts in the Mahaicony-Abary district where there are great areas of relatively light loamy to sandy lands especially well-suited to the growth of coconut palms. The late Honourable B. Howell Jones' paper in volume 2 of *Timehri* for 1883 entitled "A Visit to the Oil and Fibre Works at Pln. Fortitude" supplies a striking picture of this coconut industry at that time. The industry, as appears to be the rule with industries here in their earlier stages of inception, later fell into a condition of temporary stagnation so that in 1897 there were, including scattered trees, not more than 3,500 acres under coconuts in the whole colony. The following is practically the only reference of any importance to the cultivation of coconut in this colony which appears in the reports of the West Indian Royal Commission:—

COCOA-NUTS.

"The cultivation of cocoanuts has existed in British Guiana from an early period, but it has apparently never attained large dimensions. This is probably due to the unsuitable character of the stiff clay soils on the coast, and to the prevalence of disease. In 1847 the number of cocoanuts exported amounted to 466,530. At present, large quantities of nuts are used locally by the East Indian immigrants. The recent exports are only slightly in excess of those of 1847. Mr. William Smith's evidence before the Special Commission in 1895 indicated that at Mahaicony Creek and other localities the conditions were favourable for cocoanut cultivation, but the nuts were small, and consequently they fetched low prices. The present condition of the industry deserves to be carefully investigated. Only specially selected lands should be planted, and suitable manures applied to ensure large nuts. In America, husked nuts only are accepted, and these are packed in bags of uniform weight containing not less than 3½ inches diameter."

This statement could not be regarded as encouraging, and hence little attention was given towards the extension of the coconut cultivation until the arrival of Sir Alexander Swettenham from the Straits Settlements in January, 1902, brought a different aspect to bear on coconut-growing. His experience there had taught him that successful cultivation of the coconut is not confined to light or sandy soils near the seashore. He was aware that heavy crops of coconuts, although the nuts may be of relatively small size, are obtained from strains of coconut-palms which have become accustomed to growth on clay-loams or on heavy clay soils. He saw here coconut-palms bearing crops of exceptionally large numbers of coconuts, and he reasoned that if this is the case

on trees, isolated or in widely scattered small clumps, there should be no reason why similarly heavily bearing palms should not be grown over large areas.

At first Sir Alexander feared that the relatively small size of the nuts produced here would stand in the way of an export-industry and he moved the Board of Agriculture to import selected seed-nuts from Singapore ; but before these nuts arrived he had seen nuts from Wakenaam and from near Lichfield in the Abary district which more than favourably compared with those received later from Singapore. The Singapore nuts were sprouted and some of the palms obtained from them were planted at the Experimental Fields ; the majority of them, however, being set-out at Onderneeming. Some thousands of nuts yielded by the palms raised from the Singapore seeds have been distributed for planting-purposes. Sir Alexander Swettenham was, as he was in every way, energetically aided by the late Sir Alexander Ashmore who was largely responsible for the preparation of the earliest leaflet published by the Board dealing with coconut-planting. Oft-times Mr. Ashmore, as he then was, told me "I have never anywhere seen coconut palms bearing such great numbers of nuts as many of them in Georgetown and its vicinity do."

In January, 1903, the total area planted with coconuts was under 3,800 acres, but an impetus to coconut-planting was at once given by Sir Alexander Swettenham's views so that the area had increased to 5,140 acres at the end of 1904 just after Sir Alexander Swettenham had relinquished the Government of the colony. Since then coconut planting has regularly and steadily increased, so that in December 31st, 1917, not less than 23,870 acres had been so planted in British Guiana. The following table will illustrate the progress of the coconut-industry during recent years :—

COCONUTS, COPRA AND COCONUT OIL.

Quinquennial Periods.

Periods.	No. of acres (British) under cultivation.	Annual Export.		Coconut Oil Gallons.
		Number of Nuts to nearest hundred.	Copra lbs.	
1894-1898	... (about 3,500	4,400	..	...
1896 ...	... " 3,500	500	...	...
1899-1903	... " 3,500	34,800	...	...
1904-1908	... 7,040	314,400	...	...
1909-1913	... 12,460	1,034,100	113,400	7,500
1914, 1915 & 1916 (3 years only)...	... 18,100	1,870,300	204,850	19,317
1917 ...	... 23,870	1,911,000	178,700	26,674

As there were in round figures 9,700 acres planted prior to 1911 if the palms had been planted at proper distances and properly tended there should now be about 390,000 trees in full-bearing, producing at least 15,000,000 coconuts a year. In addition at least 2,300 acres should be commencing to bear and their yields should increase the total to about 21,000,000 nuts per annum. The annual export of coconuts is about 2,000,000 nuts. The copra exported annually represents about 325,000 nuts and the coconut oil about 1,075,000, leaving about 17,600,000 nuts available for local consumption. If this is the actual position the community can look with equanimity towards the threatened scarcity of imported fatty foods for we shall have the equivalent in food-value of $6\frac{1}{4}$ millions of pounds of butter or oleomargarine or of five millions of pounds of ghee and oil.

But does the colony produce 21,000,000 coconuts annually? I am satisfied that owing to lack of care in planting, uneven spacing, neglect of drainage and of tillage, the ravages of fungoid and insect pests, and especially lack of continuity in clean-weeding, the areas which should now be bearing are not producing nuts in numbers even approximating to those they should do. It seems to be largely forgotten by planters of coconut-palms in British Guiana that the greatest enemy to the vigorous and rapid growth of all palms is grass. If the roots of the palms have to compete with those of abundant grasses in their requirements for plant-food—and the coconut-palm is greedy in this respect—it is not possible for the palms to make satisfactory progress in their younger stages and as the yields of coconut palms are governed to a very great extent by their satisfactory early growth, they cannot produce full or even approximately satisfactory crops of good nuts. Hence our satisfaction in the greatly increased area planted has to be lessened by the unsatisfactory yield. Our exports of coconuts products have increased from 500 in 1896 to, in round figures, 1,911,000 nuts, 169,000 lbs. of copra, and 26,674 gallons of oil in 1917, and these alone represent our reserve stock of fatty foods on which we may be compelled to rely. How does this reserve compare with our recent war-time demands for fatty food?

Taking the years since the war we have imported yearly

			Equivalent in fat or oil.
Butter and its substitutes	...	550,000 lbs.	415,000 lbs.
Ghee and Lard	...	540,000 „	529,000 „
Vegetable and Animal Oils	...	278,000 glns.	2,502,000 „
			<hr/> 3,446,000 lbs. <hr/>

Under present conditions of coconut oil making it would require in round figures 15,000,000 coconuts to supply this amount of fat; but the

figures for vegetable and animal oils quoted include all vegetable and animal oils imported and not solely edible oils. The proportion of the latter may be taken as 60 per cent. of the total of these oils. This reduces the number of coconuts required to replace imported edible fats and oils to 10,600,000 nuts. We exported last year in round figures

1,912,000 coconuts equal to ...	...1,912,000 nuts
168,800 lbs. copra „ „ ...	... 325,000 „
26,674 glns. coconut oil* „ „ ...	...1,067,000 „
	<hr/> 3,304,000 nuts. <hr/>

say in round figures the equivalent of 3,300,000 nuts whilst it may require the oil from 10,600,000 nuts to replace possible shortages in butter, ghee, lard and edible oils.

Recent enquiries have proved that the ripe nuts from coconut-palms growing under the climatic conditions prevalent on the front lands of the colony not only contain as high proportions of oil as do nuts the products of any other country, but are capable of yielding copra of exceptionally high oil-content, hot-air dried copra from them having been found to contain from 72 to as high as 79 per cent. of oil. Medium-sized nuts yielded the highest proportion of oil in their copra both as sun-dried (76%) and as hot-air dried (79%).

Since Sir Alexander Swettenham left us we have found experimentally that the most reliable kinds of seed-nuts for planting-purposes are medium-sized ones yielded by palms which are flourishing—not merely existing—on lands of like nature to that on which the nuts are to be planted and under similar climatic conditions. It is not wise to endeavour to improve our strain of coconut-palms by planting seed-nuts obtained from palms growing on the far lighter soils of Trinidad or Tobago or of any other country; those obtained from Wakenaam, from near Aurora and perhaps from elsewhere in Essequibo, and specially selected seed-nuts from the Mahaicony-Abary District will give better and more vigorously growing palms, and what is more important, palms more resistant to adverse climatic influences than such imported ones will be. The sole exception to this that I am aware of are a few, a very few, of the strains imported at the instance of Sir Alexander Swettenham from the Straits Settlement.

Dr. Cramer, late of Surinam and now in Java, is strongly of opinion that a strain of coconut-palm specially fitted for growth on heavy clay soils and resistant to our local climatic conditions has been naturally evolved in British Guiana in the course of many years' growth under these conditions.

*Under ordinary conditions of extraction in the tropics 100 ripe, full-grown coconuts yield 2.5 gallons of oil. In round figures 10,000 averaged-sized nuts are required to yield 1 ton or 250 gallons of coconut oil

On the other hand from what I have seen during recent years of local coconut-palms I believe that the average annual yields from trees vary from probably less than 5 to as many as 150 nuts per tree—some trees here being of remarkably heavy bearing-power—but as a rule farmers will just as soon set seed-nuts from a palm of five nut-type as from one of 150 nut-strain.

Planting coconut-palms from nuts without reference to the bearing power of their parent palm, either in number or size of the nuts, or to its suitability to the kind of soil the seedling is to grow on, appears to me to be a singularly unwise proceeding. It is hoped to get a palm yielding crops of nuts from its seventh to its fiftieth or sixtieth year—a permanent investment—and yet the planting is done in a manner which can not be regarded as less commercially unsound than investing capital in a risky business yielding less than 1 per cent. per annum whilst it could be just as readily invested in a secure and permanent one yielding 6 or 8 per cent.

Our experience during the twenty-one years under review has, I consider, conclusively proved that coconuts are suitable for cultivation over large areas in the lowlands of the colony; that local varieties of coconuts yield very heavy crops of medium-sized nuts on relatively heavy clay soils on the coastlands, whilst on lighter lands similar varieties produce much larger-sized nuts; that there can be no doubt that the colony is emphatically a coconut land, and that as such there are in it practically unlimited areas of land very suitable and readily available for coconut cultivation.

COFFEE.

In its agricultural activities this Society has always been interested in coffee-growing. We are aware that in the eighteenth century and in the earlier part of the last century Guiana, and especially Berbice, was celebrated for the high quality of the coffee produced; and that at the time of the cessation of slavery, circumstances beyond the control of the planters necessitated the gradual abandonment of its cultivation. For instance in 1821 the export of coffee from the colony was 124,086 cwt; in 1833 it had shrunk to 51,860 cwt.; in 1840 to 30,000 cwt.; in 1845 to 4,400 cwt., whilst in 1847 it had disappeared from the list of exports. In 1896 locally grown coffee had again become an article of export but only to the extent of 63 cwt., whilst 1,763 cwt., of coffee was imported its value being upwards of \$27,600.

Sir Daniel Morris, in his subsidiary report to the West Indian Royal Commission, laid great stress on growing coffee as being next to rice, the most promising of all subsidiary products. He pointed out that for coffee-growing "British Guiana can offer exceptional advantages in soil "and climate, and in proximity to suitable markets. These are most "important elements on which to base the existence of large and "successful industries "

The following table illustrates how far his advice has been followed and with what results as regards the extension of the area planted and the exports and imports of coffee:—

COFFEE.

Quinquennial Periods.

Periods.	No. of acres (British) under cultivation.	Coffee Exported, lbs.	Coffee raw and prepared imported, lbs.
1894-1898 ...	No. records	5,600	262,700
1896 ...	" "	7,437	197,476
1899-1903 ...	718	5,580	284,160
1904-1908 ...	1,370	17,900	181,370
1909-1913 ...	2,660	115,200	83,200
1914, 1915 & 1916 3 years only)...	4,466	304,000	55,200
1917 ...	4,953	266,864	...

In 1917 the export would have been far more than doubled were it not for the lack of shipping-facilities, as in 1916 over 501,000 lbs. were exported.

The marked extension in coffee-planting during the period under review has been mainly, if not entirely, with the Liberian variety. Both Arabian or so-called Creole coffee and Liberian coffee grow with exceptional vigour, whilst the former is singularly free from disease.

Large areas of low-lying land in British Guiana are ideally suited to the growth of Arabian coffee. The meteorological conditions of these parts of the colony are very similar to those of the higher parts of many of the West Indian Islands, and when this is borne in mind the excellent way in which Arabian coffee grows on them is not surprising.

In 1897 it was already recognised that Liberian Coffee grew very well indeed in many parts of the colony, and that wherever it flourished it was very prolific. It has since been found that at times and in certain places the difficulty is to restrict its bearing-propensities sufficiently to prevent the trees either permanently injuring itself or even dying from the effects of over-production. Climatic conditions on lands situated at some distance from the coast-line and on the lands along the lower reaches of the rivers are the most favourable for the growth of Liberian coffee.

There are still plenty of openings for the development of plantings of coffee, the best of which, perhaps, are on the lands bordering both banks of the Berbice river along its course from about 30 to 150 miles from its mouth, whilst similar plantings in the North West and in the Pomeroon Districts would be of almost equal promise.

Whilst progress in this Colony with regard to coffee-planting during the past ten years appears to us to be marked, our coffee-industry is practically in a deplorable state of stagnation in comparison with that of our neighbours in Surinam. There not only has the area planted with Liberian coffee been greatly augmented but coffee is being grown on excellent cultural lines, such as are followed by very few indeed of our planters, with the result that on plantations there—plantations having from, say, 400 to 800 acres of Liberian coffee in full-bearing—returns of coffee per acre are attained which to growers having only local experience are almost incredible. I do not know of any coffee-plantation here that can point to fields which yield year after year crops of from 1,500 to even 2,000 lbs. of cured coffee per acre. Not alone have the Surinam coffee-planters materially extended their cultivation and vastly increased their yields per acre but by the establishment of coffee pulping, drying, cleaning and grading machinery of the very best modern types they have brought their product from being one of the lowest valued types of coffee on the market to one occupying a very prominent position among the highest grades of coffee in the market of New York. Unfortunately there are not any coffee-plantations here of areas sufficient in the opinions of their owners to justify investment in the latest types of coffee-machinery and what is equally important, the employment of managers capable of getting the best results from the best equipped factories. I am satisfied that there is a certain remedy for this condition—it is the installation of co-operative coffee factories in each of the more important coffee-producing districts of the colony. These are at present the Polder District, West Bank, Demerara River, where the pioneer factory should be established; the North West District; and the Pomeroon River District. I have little doubt that a pioneer-factory in any one of these districts would be followed by demands for similar factories on the Essequibo coast, the Berbice river district, and last but not least from the very competent horti-agriculturists of Golden Grove and its immediate vicinity.

CACAO.

Cacao-planting does not appear to have ever been a prominent or even a very promising industry in this colony. It was, however, one of the earliest followed here and the great trees still remaining in the cacao-grove, the sole remnant of the former plantation Markeye, at Coomacka on the Berbice river testify to this. Our former President, the late Honourable B. H. Jones, described in *Timehri*, 1884, a visit to this cacao-grove in the following words:

“One cannot leave this district without paying a visit to Coomacka, “as I venture to think that here will be found some of the largest cocoa “trees in the world; and my friend Mr. Nind, who accompanied me, is “sure that there are none like them in Trinidad; not trees to suit a cocoa “planter but wild, luxuriant overgrown specimens, samples of what a “cocoa tree if left to itself in a suitable soil will grow to. Some of these “trees, groups of gigantic stems, are from 50 to 70 ft. high, with “branches extending 67 ft. and measuring at a distance 5 ft. from the

"ground, 9 ft. 5 in. in circumference. One single stem which we carefully measured had a circumference of 3 ft. 4 in. Few pods grow on these trees, but what there is of them, are large, of the yellow variety, containing an average of 40 beans."

Now many of these past giant-cacaos have fallen but along each fallen trunk new trees, some of them 30 to 40 inches in circumference, have sprung. The cacao appears to be all of one type and to be quite true to that type. It is the strain or type formerly known as Golden Caracas, probably the best cacao in the world. The pods are green in earlier stages passing through light-yellow, and yellow to a full glistening golden yellow when mature. The husks are thin and the beans full, round and of excellent quality. There is not a speck of colour other than golden yellow on the fruit as they hang dependent from the trees.

Near the Anglican church at Coomacka are the tombstones of three of the former "Master Planters" of Pln. Markeye, marking the tombs of De Her Cornelius Raasche who died in 1721; of Monsieur Nicholas Raasche* who died in 1722, and of De Her David Back who died in 1734

Berbice appears to have been the part of the colony where in early days cacao was principally produced. The maximum export, 114,000 lbs. in those early days was in 1820. Like the early coffee-industry cacao-planting was adversely affected about the time of the abolition of slavery, the exports steadily decreasing from 1820 onwards until they disappeared in 1832. Cacao did not re-appear among the exports until 1886, its export in that year amounting to 2,000 lbs. In 1896 the export was about 47,900 lbs. increasing in 1897 to 105,000 and attaining its maximum of 124,000 lbs. in 1900. The progress of the industry as measured by the area occupied and the exports and imports of cacao is shown in the following table:—

CACAO.

Quinquennial Periods.

Periods.	No. of Acres (British) under cultivation.	Cacao Exported Lbs.	Raw Cacao and prepared cacao imported lbs.
1884-1888 ...	No. Records	5,000	102,200
1889-1893 ...	" "	16,000	116,000
1894-1898 ...	" "	84,600	28,000
1896 ...	1,400	47,860	24,550
1899-1903 ...	1,460	95,900	10,470
1904-1908 ...	1,940	73,100	20,590
1909-1913 ...	2,140	54,500	20,970
1914, 1915 & 1916 } (3 years only)	2,200	52,000	20,880
1917 ...	2,000	7,840	

*These tombstones indicate that Monsieur Nicholas Raasche who was born in 1649 was the earlier "Master Planter" and probably proprietor of the estate and Cornelius Raasche, his successor as "master planter," was his son born in 1689.

Sir Daniel Morris in 1897 visited with me Plantations Coverden, Land of Canaan, and Vryheid on the Demerara River. Of the former plantation he wrote:—"The condition and upkeep of this property are equal to anything in the West Indies." Sir Daniel noted that the yield of cured cacao on the plantations varied from 160 to 230 lbs. per acre per annum. The production of cacao in 1896-1897 was estimated at 200,000 lbs. per annum. I doubt if at present it exceeds 275,000 lbs. a year.

It is desirable to reproduce here the opinion of that master in economic botany, the late G. S. Jenman, as officially expressed in 1897 with regard to the two industries I have just dealt with. It was—"With due selection of situation and soil few countries are better adapted to coffee and cacao cultivation than Guiana."

In connection with that opinion the Government decided to enquire into the composition of the soils on which our neighbours in Dutch Guiana then successfully carried on their cacao-cultivation and have later developed their very flourishing coffee-estates. The following is taken from *Timehri* page 71 of the Volume for 1898, and is an extract from a letter I wrote covering the submission to this Society of copies of analyses of a series of Surinam typical cacao and coffee soils of marked to great fertility;—

"The examinations of the soils conclusively shews that they are not soils similar to these already examined from the interior of this colony, but are soils very similar in characters and compositions to the alluvial ones which occur on reaches of our rivers below the belt of sand dunes and hills. This is a matter of interest and of importance as shewing that in Dutch Guiana the cultivation of the economic products, cacao and coffee, are satisfactorily carried on on such soils, and, therefore, similar enterprises in this colony may be attended with success. These lower river soils are those alluded to by Dr. Morris in paragraph 4 of his Report subsidiary to that of the West India Royal Commission."

To what is the present stagnation in the cacao-industry due? To my mind it has been largely due to the fact that the planters of cacao in the seventies to nineties of the last century were wedded and adhered to the Trinidad policy of densely shading the trees with the Bois Immortel or Oronoque trees. Shade which in the climate and on the soil of Trinidad may be, I do not say it is, beneficial to the cacao-tree is not required, and may be, and probably frequently is, detrimental to the tree in the usually moist and cloudy atmosphere of the lower river-lands of British Guiana. It is also largely due to the stringent demands of the cacao for loamy, well-drained lands. The tree may, and in places does, flourish on insufficiently drained lands, but on them it does not produce satisfactory crops of fruit. It is also due to the very salient fact that whilst in the first, second and possibly third years after the planting of the young cacao, ground-provisions may be grown between the trees the sale of which may meet the costs of upkeep of the fieldse and possibly yield

some profit, during the fourth, fifth and sixth years, whilst the cacao-trees are slowly coming into bearing, payable crops of ground-provisions cannot be raised without very great detriment to the cacao-trees. Hence cacao-growing on any scale here cannot be a poor man's industry—and unfortunately in this colony it is to the poor peasant farmer we have all learned to trust for progress in new industries.

Our larger landed proprietors apparently hold that having money they may lose some or all of it if they act as pioneers in new agricultural pursuits, but as the small peasant farmer can have little or has not any money he cannot lose much or possibly not any, and hence he is the only person justified in undertaking such preliminary ventures. Still, however, if the smaller man can find good enough security, philanthropists will lend him the funds with which to make his trials. We are indeed essentially a business-community in these matters.

Several of our larger cacao-properties more especially that, in 1897, very excellent plantation Goverden received a most severe set-back when they changed proprietors during the rubber-booms from 1906 to 1910 or 1911. Young cacao was neglected and in many cases abandoned; rubber-trees either Sapium or Para being planted in its stead. The care of the older trees, upon which the crops of cacao so greatly depend, largely ceased; drainage was not kept up, cultivation and even pruning of the trees were reduced to their lowest limit, whilst cutting-down bush and even ordinary weeding were more or less abandoned. Left thus to nature, and the delicate cacao-trees thereby exposed to the attacks of fungoid and insect pests, is it not a wonder that the cacao-industry of British Guiana has merely stagnated and not been entirely lost?

PARA RUBBER.

Probably the only person in the colony keenly interested in its rubber-producing possibilities in 1896 and 1897 was the then Government Botanist, the late G. S. Jenman, who as his earlier writings prove was an enthusiastic believer in the possibilities of rubber-growing *on the large scale* in British Guiana. In 1897 there were five trees of Para rubber at the Government Agency at Morawhanna, nine in the Promenade Gardens, Georgetown, one only at the Botanic Gardens and a dozen or so at Pln. Diamond. During 1898 and 1899 seeds were imported from Trinidad and plants raised from them were sent to several properties in different parts of the colony, principally to Noitgedacht in the Canals Polder district, then the property of the late Thomas Garnett.

Exaggerated ideas* of the value of the wild Hevea trees of the colony were rife, and of these trees Sir Daniel Morris wrote in his subsidiary report to the West Indian Royal Commission as follows:—

*These ideas were due to an expression of opinion by Prestoe, the eminent Botanist in charge of the Royal Gardens, Trinidad, in or about 1877 that the Touckpong rubber with which the Aboriginal Indians made their balls and which was occasionally brought to Georgetown by them was obtained from *Hevea Guianensis*, one of the true rubber-bearing trees, but which it is now known does not occur in British Guiana. It is deserving of record that the object of Jenman's first journey into the interior of the colony was to collect seeds of the alleged *Hevea Guianensis* for the Trinidad Government.

“It is very desirable that all these rubber trees should be carefully and exhaustively investigated in order to find out their true value. It is probable that it may be found profitable to establish natural plantations in districts where the best rubber trees are already found. This could be done with little difficulty, and it offers the best means of immediately extending the area under rubber trees in different parts of the colony. Where plants are plentiful it would only be necessary to clear away some of the other vegetation, and allow the rubber trees more light and air, also thinning them out when too crowded. Where the conditions are favourable, and the plants only sparsely found, wild seedlings might be transplanted or fresh seeds “dibbled in” at intervals to fill the vacant places. The cost of this plan would not be considerable as the trees would require little attention after they are well started.”

Possibly by an oversight the planting of the true Para rubber (*Hevea brasiliensis*) was not suggested in the report as likely to be a promising arboricultural venture although Sir Daniel Morris had mentioned to me the desirability of experimental plantings of it. As a result of the above-quoted recommendations the latices of a considerable number of varieties of native trees were examined during 1897 and the immediately succeeding years, and were found either not to contain rubber but solely resins, or the rubber found was not in sufficiently large proportions to render its separation commercially feasible, or else the rubber obtained was so “tacky” as not to be of commercial value. With the exception of planting at Onderneeming some Para rubber trees obtained from Trinidad soon after Sir Alexander Swettenham assumed the Government of the colony in 1902, practically no steps were taken in connection with Para rubber-planting until 1904 when after much difficulty small supplies of Para rubber seeds were imported by the Department under my charge.

The following shows with approximate accuracy the areas under Para rubber in the colony at successive four-yearly intervals :—

1897-98	...	...	about 30 trees,
1902	...	...	2 acres.
1906	...	...	16 „
1910	...	...	1,240 „
1914	...	...	4,700 „
1917	...	...	5,200 „

During the period from the earlier extension of plantings of Para rubber, that is from 1910, to date it has been found that on suitable land the growth of Para rubber is not less rapid than it is in the East, while recent trials indicate that a yield of dry rubber per tree as good as that obtained on the best Eastern plantations can be obtained. The cost of collection and preparation of the rubber indicates that a reasonable profit can be expected with the market value in London of the product at 2s. per lb. The relatively good health of the labour-force, the low cost of supervision on

estates, and the proximity of the colony to the United States of America, are factors which should encourage the extension of this industry in the colony.

On the other hand three great difficulties have arisen.

- (a) the insufficiency of the available labour-force to continuously tap large areas of Para rubber trees,
- (b) the insufficiency of the labour-force to keep the land planted in Para rubber satisfactorily weeded, and
- (c) A disastrous outbreak of the Para rubber leaf-disease.

It is difficult to suggest any remedy for the conditions (a) and (b); conditions which at the present time appear to be insuperable.

The ravages of the leaf-disease have been and are more serious than elsewhere in the colony in the forestal districts where conditions should be ideal for the cultivation of Para rubber; some small plantations such as those on the bauxite hill at Christianburg, at Greenheart Camp on the Demerara-Essequibo railway, at Coverden and especially at Land of Canaan on the Demerara River having been actually wiped out. At other places, as for instance at the Hills and Alikí Estates on the Mazaruni and Essequibo rivers, at Vreedestyn on the Demerara river, and at Creeklands on the Canje river, the disease although still strongly in evidence has to a considerable extent stayed its ravages and it is hoped that, as an important aid to the remedial measures being carried on, the occurrence of a somewhat prolonged period of dry weather in place of the almost incessant rains which have characterised recent years at these places will put an end to it; whilst at some other places, such as Issorora and the Auka rubber estates, the disease has been brought more or less under control.

As the Kew authorities long ago pointed out would be the case Para rubber has completely failed to make satisfactory growth on the old canelands in the near vicinity of the coast, but on lands four to six miles from the coast as at Tuschen, Cane Grove and at Mon Repos, Para rubber is doing well and the trees are practically free from the leaf-disease. The finest and best grown trees I have seen in the colony are on the back-lands of Plantation Mon Repos. The conditions at Onderneeming where the first plantings of Para rubber in this county were made by me in 1902 and 1903, the trees have flourished satisfactorily and are quite free from the leaf-disease.

In connection with the expressed views of Sir W. (then Mr.) Thistleton-Dyer at that time Director of the Royal Gardens, Kew, which were similar to but far less practical than those I have quoted from the Subsidiary Report, I may be permitted to reproduce

from *Timehri*, Volume X, for the year 1897 the following extract from a report the author of which was the late S. M. Bellairs, writing in consultation with the Government Botanist, the late G. S. Jenman :—

“With regard to paragraph 16, suggesting that the Government might scatter India Rubber seeds in suitable places; the question is to find such suitable places that are accessible. It is of no use to scatter seeds in the forest. The struggle for existence in a tropical forest is so keen, that out of fifty seeds scattered not one germinates; and out of five hundred that germinate scarce one attains any growth. As a proof of this, the well-known fact may be adduced, that when a clearing is made in the forest a ‘second growth’ immediately springs up of itself consisting of trees quite different to those cut down, and this second growth must spring from seeds that have been scattered many years ago and lain dormant for a very long time, waiting the chance of a ray of light to enable them to grow. Unless India-Rubber seeds possess wonderful vitality they would die before the chance arrived.

“There is no *cleared* land in the interior that will grow trees. “Whatever is suitable for trees is covered with forest.

“The only chance for these India-Rubber seeds would be to plant them on some land that has already been cleared, and to look after the trees when saplings.”

This statement is one of importance not only in connection with the then suggested mode of planting rubber-trees but with that of any reafforestation which may in future be contemplated with, for example, such trees as crabwood (*Carapa guianensis*) and balata-tree (*Mimusops globosa*).

SAPIUM RUBBER.

In 1897 some interest was taken in the probable exportation of the excellent rubber then yielded by the Touchpong, *Sapium Jenmani*. Its rubber had long been exported from the colony as it was the practice in the earlier days of the balata-industry to mix the latex of the *Sapium* with that of the balata-tree. Possibly on this lies the explanation of the fact that some of the earlier writers when dealing with balata described it as being intermediate in properties to gutta-percha and india-rubber. Owing to the interest taken by Sir Alexander Swettenham in offering in 1903 prizes for the best samples of rubber collected in the colony from indigenous trees a small export trade in *sapium* rubber sprung up but it never exceeded 7,000 lbs. of rubber in any one year.

The recorded exports commenced with 950 lbs. in 1904 and rose steadily to 6,870 lbs. in 1907, thence gradually decreasing, falling to less than 200 lbs. in 1912. The total amount of *Sapium* rubber exported from the colony as such was approximately 31,000.

The ready sale of the *Sapium* rubber collected from indigenous trees resulted in the planting of a considerable area—400 to 500 acres—of

these trees in various districts of the colony, more especially in the North West. The planting was followed by most disappointing results. It was found that the yield of rubber from the sapium-tree was small; that when tappings were repeated for more than a few days at a time, in place of establishing a wound-response the rubber yielded became "tacky" and unsaleable, and that the cuts in the bark of the tree did not readily heal and remaining open supplied opportunities for insect and fungoid attacks to which the tree is very susceptible. The yield of the cultivated trees proved to be far lower than that of the indigenous trees. The land planted in sapium has therefore been either abandoned or replanted with Para rubber.

SUITABILITY OF BRITISH GUIANA FOR RUBBER PLANTING.

A recent writer in this Journal appeared to believe that I have done all that I could do to discourage the rubber industry. This is untrue. My views are on record in the following, written and published early in 1907:—

"It is very much to be regretted that several years ago, when Sir William Thistleton-Dyer suggested that attempts should be made in planting rubber-bearing trees in parts of the forest-land of British Guiana, the great value of his advice was not appreciated and the opportunity was neglected. All that can now be said is that many parts of the colony appear to be almost ideally suited for the cultivation of certain kinds of rubber-trees."

What I actually did, and upon which the statement in *Timehri* may have been based, was to indignantly refuse certain offers to make it well worth my while to join in booming the colony as a land having vast reserves of Sapium and Hevea rubber trees and great potentialities for their cultivation. These overtures were made to me in London in 1907. Similar overtures were made about the same time to the late Commissioner of Lands and Mines, Mr. Frank Fowler, F.G.S., and received like treatment from him.

The Department under my charge has done everything in its power to encourage the rubber-industry; the Governors, especially Sir Frederic Hodgson and Sir Walter Egerton, similarly have made every effort feasible in the same direction; whilst the appointment in 1913 of our present Government Botanist, Mr. C. K. Bancroft, a recognised expert on Para rubber-growing, is a proof that the Colonial Office shares the view that many parts of the colony are ideally suited for the cultivation of Para rubber.

The greatest set-back in progress the Para rubber-industry has experienced was the almost complete failure of the shipments of Para rubber seeds from Malaya in 1910-1911 due to an attempt to improve on our directions as to mode of packing, the seeds being sent in hermetically sealed tins instead of merely closely covered ones. This caused the loss of 527,400 seeds which if they had retained their normal germinating

power would have produced 370,000 plants which would have sufficed for 4,000 acres. This shipment was made at the inception of Sir Frederic Hodgson and its failure was a very keen disappointment to him.

FRUIT.

On several occasions during 1897 the attention of the Society or of its Committees was directed towards the possibility of the establishment of an export trade with fruits of various types. The then Government Botanist, the late G. S. Jenman, was an enthusiastic advocate of the establishment of such an industry. He was not a believer in the policy of endeavouring to make a living by taking in one another's washing or by the mutual interchange of swine, even if these were carried out on the soundest co-operative basis. He held that no real advance could be made in the colony either in the cacao, the coffee or other arboricultural industry until it became feasible to export the transient products raised in fields planted with such permanent crops and to sell them at remunerative rates. He held that banana-growing was the special fruit-industry which deserved encouragement; he advocated planting here the Chinese, Cavendish or Dwarf banana and not the Jamaica kind as he had satisfied himself that under local conditions the Jamaica kind was very subject to disease, whilst the plant grows so high and with an insufficiently robust stem to bear the weight of the fruits without the bunches being supported by staking, which would add greatly to the costs of production.

He also advocated the shipping of citrus fruits, especially of oranges and grape-fruits. Sir Cavendish Boyle, Vice-President of the Society in the year I was President, was a staunch advocate of the great possibilities of a fruit industry but he gave prominence specially to lime-growing. I may here record that the first planting of limes on a large scale at Onderneeming which took place in 1900 was due to directions I received from Sir Cavendish. Unfortunately the immediately succeeding "powers that be" did not see eye to eye with him with regard to possibilities of a lime-growing industry and I was not allowed to plant with limes the belt of land which Sir Cavendish had selected for that purpose. If we had been able to follow up lime-planting at Onderneeming on the lines he advocated, that industry in British Guiana would be further advanced than it is to-day.

In 1906 a visit by Mr. W. L. Bennett on behalf of a syndicate of lime-juice and citric acid makers increased the interest taken in the possible cultivation of limes. The starting of a plantation at Agatash, Essequibo River and the establishment of a small citrate of lime factory at Aurora by the syndicate gave a stimulus to the planting of limes. In 1897 there were not more than 5 acres in the colony devoted to lime-growing; now there are upwards of 1,480 acres. It has been proved that there are wide areas of land available, and very suitable, for the

cultivation of limes. The growth attained by trees planted on the light lands of the lower reaches of the Essequibo river fully justifies an extensive cultivation of lime trees in that district.

The heaviest crops of limes are obtained on the loose friable alluvial coast and river soils but the trees grow and bear well on the lateritic soils of the interior of the colony. The trees do not grow so well nor yield such satisfactory crops of fruit on heavy clay lands either on the coastlands or in the interior. Would-be growers of limes should use great care in the selection of soils for that purpose. Lime-growing is an industry peculiarly well suited to the smaller land owners and the peasantry of the colony especially for those residing on the lower reaches and in the islands near the estuaries of the great rivers. Having this in mind the Government has established a lime juice concentration factory at Onderneeming where excellent results are being obtained. In the county of Berbice Messrs. Davson & Sons have established a factory for the production of citrate of lime and of concentrated lime juice, whilst a large and exceptionally well-equipped factory has been erected and is at work at Agatash, Essequibo River.

The records of the exportation of lime products during the past three years are as follows :—

	1915.	1916.	1917.
Lime juice, ordinary, gals. ...	...	...	13,596
Lime Juice, conc., gals. ...	4,440	8,565	3,691
Citrate of Limes, cwts. ...	170	466	155
Essential oil of Limes, glns. ...	...	290	251

In British Guiana on suitable soils the lime trees—when well tended—are generally free from disease and insect pests; the limes produced are large and juicy fruit, and their acid and essential oil content is very satisfactory, whilst the progress made during the latter part of the period under review indicates that the Colony should become one of the most important producers of limes and lime-products in the world.

BANANAS.

In 1907 I spoke as follows :

“Probably the most promising of the colony's agricultural resources is the cultivation of bananas. There can be few, if any, places better suited from soil and meteorological conditions, and from the topography of the land with its everywhere-prevailing system of natural and artificial waterways, than the coastlands of British Guiana for the cultivation of this fruit. The bananas grown in this colony are of large size and of excellent flavour, far superior in fact to the majority of the more or less miserable specimens of the fruit now seen in London, Manchester, and other large towns.

“If facilities are provided for the rapid transport of the fruit from the colony and for placing them on the market, there can be little

“doubt that a great impetus will be given to the cultivation of bananas in the colony, and that in the course of a few years British Guiana will become one of the leading places in the world for the exportation of the fruit ; unfortunately at present lack of means of transport makes this impossible.”

When banana-growing was commenced on a very large scale in Surinam it appeared that it might be advisable for this colony to follow the example set by our neighbour. As you may remember, a special Commission was appointed to enquire into the possibility of the establishment of such an industry here. A Committee of the Commission visited Surinam and made an exhaustive study of the conditions under which the industry was being carried on. Unfortunately the Agent of the United Fruit Company in Surinam had to inform the Committee that on no account would the Company extend its activities to British Guiana, whilst it was prepared, in order to conserve its virtual monopoly of the banana-market in the United States, to offer active opposition to our successfully marketing bananas in that country. The Commission realised that without the hearty co-operation of the United Fruit Company the question of banana-growing on a commercial basis in British Guiana was not then feasible. Further it did not appear advisable to make plantings of the Jamaica or Gros Michel banana in British Guiana whilst the plantations in Surinam were being devastated by a disease to which that banana had succumbed. Hence the Commissioners were unable to recommend to the Government the expenditure of the very large sum of money necessary to inaugurate a banana-growing and exporting industry. The question of banana-growing, however, has not been lost sight of ; I may place on record that I have not in any way swerved from the opinion I expressed in 1907, and I believe that after the termination of the war banana-growing, using immune varieties such as the Dwarf and the Congo, may become one of the export-industries of British Guiana.

Plantains and bananas are, I fear, not being grown on the same scale here as they were in 1897. This is to be regretted, especially during the existence of the present war-conditions. Both plantains and bananas are foods of exceptional high value. Probably a plantation of Dwarf bananas on rich or fairly rich loamy land produces far more food per acre than does wheat, rice or other crops. It is well-known that the starch of the banana or plantain is much more readily digestible than are the starches of wheat, maize, rice and other cereals. The fresh almost ripe to ripe banana contains, in addition to vitamins and other accessory bodies, among its various enzymes a very active invertase. Possibly owing to these conditions the ripe banana is one of the most readily assimilable of all food-products. In my own experience I have found it to be one of the most sustaining when walking in the “bush.” Upon the recognition of these facts the banana should become in many countries a

staple food and be so employed in continuously increasing amounts; should this be so British Guiana must become one of the recognised sources of that staple.

We have made no progress with the cultivation of other fruits. It is exceedingly doubtful if there now are as many oranges, mangoes, avocado pears, sapodillas, guavas, pineapples, and similar fruits produced here as they were in 1897.

FIBRES.

Although some attention has been given to the subject of fibres, including cotton, during the period under review there is not any commercial progress to report.

During 1897 and the immediately succeeding years this Society devoted some attention to the suitability of crowa fibre for rope-making purposes. The fibre of the Crowa is known to the Indians and the river people generally as the strongest obtainable, and the plant is therefore grown by them in small quantities for the supply of hammock-ropes, bow-ropes, fish-lines, and even for thread. Crowa is specifically identical with the common pineapple *Ananas sativus*, but has been described under two separate specific names, *Ananas mordilona* and *Ananas glaber*. It however must be regarded as a well-marked variety of the common pine-apple. The reports obtained from rope-manufacturers in England to whom consignments were sent more than confirmed its local reputation and proved its fibre to be of very exceptionally high value. Some acres were planted with it on behalf of the Society at Christianburg. It was found, however, that the yields per acre were exceedingly low and hence the costs of production were prohibitive. This is very regrettable as, if it could have been produced at a price which would enable it to compete with Manilla hemp, a leading firm of rope-makers in England were prepared to make investments in land here for its cultivation. The cultivation of crowa is a possible asset for the future when the population has increased and means of communication with the lands suitable for its growth have been improved.

Attention was next turned toward cotton and for several years a great deal of intermittent interest was taken in the possibility of growing Sea Island cotton on the coastlands of the colony. Field-trials made on several plantations in Essequibo, Demerara and Berbice proved beyond doubt that, owing to the heavy nature of the soil and the prevailing meteorological conditions, it is not possible to commercially produce on the coastlands of the Colony either Sea Island cotton or Egyptian cotton. Attention has since been directed towards producing a hybrid cotton, a cross between the Creole or Buck cotton and the Sea Island cotton. This has been carried to a successful issue by the local botanists. A perennial cotton of fixed character has been obtained having the vigour and the resistant power to local meteorological conditions of the Creole or Buck cotton, whilst producing lint closely approxi-

mating in market-value to the Sea Island. Owing doubtless to labour-conditions no interest has been taken in this commercially. Its utilisation is a problem of the future.

Attention has also been directed towards Sisal cultivation ; Sprostons' making the first large sisal cultivation at Cole's Glen on the Demerara-Essequibo Railway. As long as the land was new and contained some of the accumulated plant-residua of its former forest-growth the sisal grew excellently ; but as these residua became exhausted, and the vigour of the plants thereby lessened, the sisal was attacked by the highly destructive sisal leaf-disease, *Colletotrichum agaves*, and the plants were practically all destroyed.

Spsostons' were followed by the sisal-planting enterprise undertaken by the Bartica Agricultural Estates Company at the Hills, Mazaruni River. Over 250 acres were planted with sisal and a very effective sisal-cleaning factory was erected. Excellent fibre was produced, but the high price of production, owing to labour-conditions, combined with the low yield of fibre per acre on the sandy soils stood in the way of the venture being a commercial success. As the light soils at the Hills became impoverished in plant-residua the sisal leaf-disease broke out. and did great injury to the plants. The company, being of opinion that on the soils and under the meteorological conditions existent at the Hills the cultivation of Para rubber should prove far more remunerative than that of sisal could be, ceased to cultivate the latter and shut down their fibre-producing enterprise.

PROVISION-CROP GROWING OR FARMING.

I have already alluded to the cultivation of rice, bananas and plantains. As you are all aware the production of vegetable foodstuffs for very many years past has been left almost entirely in the hands of small farmers, although some of the large companies interested in the exploitation of cacao and rubber in the earlier years of their ventures have produced considerable quantities of ground-provisions as catch-crops between their trees. The area carrying provision-crops in the colony is not a large one in proportion to the number of inhabitants. In 1897 a larger area was under provision-crops other than rice on the empoldered sugar-estates than at present. In that year 4,100 British acres were so occupied; for 1918 the area is only 1,550 acres. On the other hand, as I have already shown, the area under rice on sugar-plantations is now very large and hence their production of foodstuffs has greatly increased during the period under review.

The principal reason for the reduction of the area under plantains and similar food-crops on the sugar-estates is that land is now fallowed by flooding instead of being let out to farmers for provision-planting.

Our records as to the area under provision-crops in the colony generally do not extend back to 1897 ; the earliest fairly reliable ones being those of 1904-5 which showed that 19,450 British acres were

occupied with plantains, maize and ground-provisions as against 23,880 acres in rice ; now there are 18,250 acres under provision-crops generally and upwards of 58,000 acres under rice.

From early times in the history of the colony the Pomeroon District, and from the inception of cultivation in it the North West District, has been largely devoted to provision-growing. The following table is of interest as showing the increasing importance during very recent years of these districts in the production for the use of the colony of the various vegetable foodstuffs, so important in our dietaries for supplying vitamins or "accessory substances :"—

ACRES UNDER PROVISION CROPS.

	Pomeroon District.	North West District.	Rest of Colony.	Total.
1905	1,180	about 1,200	18,080	20,460
1910	900	870	17,430	19,200
1915	910	1,260	19,940	22,110
For 1918 ...	1,250	1,320	15,680	18,250

It is hoped that the erection of the Government flour mill will be followed by largely increased planting of maize, Guinea corn, and the various pulses ;—products which can be readily and economically changed into permanent forms such as flours which should be of export value to other parts of the West Indian Province.

TOBACCO.

The subject of tobacco-growing was an oft-discussed one by this Society in and about 1897. Since then the tobacco-industry has had the encouragement of a Government Commission, of two or more Government Committees, and of two or more sets of Regulations with the result that there is less tobacco grown in the colony now than there was in the late nineties. We are all aware that coarse-textured and strong-flavoured tobacco grows luxuriantly on the coastlands ; that finer-textured, better flavoured tobacco will grow excellently on the lighter soils ; and that excellent tobacco used to thrive and possibly is still grown on the hinterland savannah lands, the texture and composition of the soil of parts of these being as I have shown elsewhere admirably adapted to the cultivation of fine tobacco. The main or rather the sole difficulty in the manufacture of heavy flavoured tobacco on the coastlands is the high moisture content of the atmosphere which is inimical to satisfactory curing. The meteorological conditions on the hinterland savannahs are such that curing should be relatively easy. Tobacco-growing on a large scale is too dependent on a supply of readily available, highly skilled, horticultural labour at certain times to loom under present conditions as

an important industry for British Guiana. It is, however, one of the potentialities of the colony which we trust will be very successfully exploited in the near future.

LIVE-STOCK.

There is not any estimate available as to the live-stock of the colony in 1897. Our earliest returns are for 1902, but these probably represent fairly the 1897 position as the severe droughts of 1898 and 1899 proved very inimical to increase in numbers of live stock. The best obtainable comparisons of the live-stock on the coastlands in 1902 and for 1918 are as follows :—

		1902-3.	1918.
Horses	... ..	1,423	970
Cattle	... ..	70,150	99,000
Buffaloes	... ..	14	368
Goats	... ..	15,600	13,750
Sheep	... ..	11,850	22,000
Swine	... ..	11,900	11,800

In 1897 the great majority of the "Gentlemen in charge of Sugar Plantations" possessed large herds of cattle but a change in the policy of the proprietors of such plantations now restricts the managers from having on the estates herds of milch and other cattle. This restriction may be in the interests of the proprietors of the estates, although I have my doubts if it is so at the present time when nitrogenous manures are unobtainable, but it has been and is very detrimental towards the improvement of the live-stock of the colony, having done away with excellent object-lessons given by highly skilled agriculturists and stock farmers to small farmers and cattle-keepers. It is greatly to be regretted in the interests of the colony at large that proprietors of sugar estates, having deprived their managers of a highly valued perquisite do not carry on a cattle and especially a swine industry as subsidiary to sugar manufacture.

There is, in my opinion, a great future before the colony as a stock-raising country and hence the cessation of many of the important cattle-raising enterprises which were being carried on in 1897 along the frontage of the coastlands from Skeldon in the east to Hampton Court in the west is much to be regretted. Their place has been taken to some extent by companies formed for ranching purposes.

Still the increase of the cattle in the front lands of the colony from about 70,000 head in 1897 to upwards of 99,000 head for 1918 has been noticeable; and is the more satisfactory because it has taken place during a period in which the great outbreaks of anthrax in Berbice and East Demerara occurred, whilst the disastrous effect of the great droughts of 1898 and 1899, and of 1911 and 1912 were accompanied by very high rates of mortality among the coastland cattle. It has been estimated that the low-level coastlands and river savannahs could supply pasturage suffi-

cient for ranching 650,000 head of cattle, whilst the hinterland savannahs, upon which it is estimated there are at present upwards of 20,000 head of cattle with probably about 600 horses, could at a very low estimate carry a quarter of a million head.* The colony should not alone be the granary for the British West Indies but it should become the main source of beef and of horse-flesh for the more southerly West Indian Islands.

RESUMÉ OF AGRICULTURAL PROGRESS 1897 TO 1918.

In British Guiana we are all of us prone to run ourselves, but more especially others than ourselves, down on grounds of the lack of progress in the colony. Has the colony made any progress in its agricultural pursuits during the period which has elapsed from the visit of the West Indian Royal Commissioners in 1897, the year in which I for the first time presided over the Society? I have, I think, shown that whilst some agricultural industries, especially the staple one of 1897, have not made satisfactory progress or have remained in a state of relative stagnation, others have made from fair to well-marked progress. This can be seen at a glance in the following tabular resumé giving in round figures the statistical facts I have alluded to in this address:—

Cultivated Lands in British Guiana 1897 and 1918.

BRITISH ACRES.

		1896-97.	1917-18.	Increase.	
				Acres.	Per Cent.
Sugar Canet†	...	71,300	77,830	6,530	9·1
Rice	...	6,500	58,090	51,590	793·7
Coconuts	...	3,500	23,870	20,370	582·
Para Rubber	...	$\frac{1}{2}$ acre	5,240	5,240	5,240·
Coffee	...	about 600	4,950	4,350	725·
Cacao	...	„ 1,400	1,970	570	40·7
Limes	...	„ 5	1,480	1,475	2,590·7
Farmers' Crops	...	„ 19,000	18,250	decrease 750	decrease 3·9
		102,305	191,680	89,375	87·6

*Should these ranching lands prove to be equal in grass-producing power to some of those of the Western United States, they should suffice for grazing half a million head; the above low estimate is based on Brazilian savannah experience (about 40 head to a square mile).

† Including farmers' canes.

*Per Cent. of Total Area Under the Various Crops in 1896-97
and in 1917-1918.*

	1896-1897.	1917-1918.
Sugar Cane ...	69.70	40.60
Rice ...	6.35	30.31
Coconuts ...	3.42	12.45
Para Rubber ...	.0005	2.73
Coffee ...	.60	2.59
Cacao ...	1.37	1.02
Limes ...	.005	.77
Farmers' Crops ...	18.56	9.53
	<hr/> 100.00	<hr/> 100.00

AGRICULTURAL LOAN BANKS.

The Society took interest in and devoted much time to discussions of various proposals for the establishment of Agricultural Loan Banks. Owing to the practical initiative of Sir Frederic Hodgson whilst Governor of the colony this has become an accomplished fact during the period under review and the banks promise to exert a marked influence on the existence of what may be termed peasant-industries, such as cane-farming, coconut, coffee, cacao, lime and tobacco planting on the small scale. The enthusiasm with which the inauguration of these banks has been received is an excellent augury for the future of the small farmer and peasant proprietor of the colony.

FORESTAL INDUSTRIES.

In and about 1897 the Society showed much interest in the Forestal and Mining industries of the colony as well as in the purely agricultural ones. With three exceptions,—balata, lumber and diamonds,—progress in them has not been satisfactory.

At that time the Society had frequent discussions regarding the possibility of developing an export trade in the timbers of the colony, and on the initiative of Sir Cavendish Boyle took practical steps by exporting logs of the more promising varieties of local woods to London. Much has since been done in the hope of increasing the export demands for British Guiana timbers but with very little effect.

The collection of gums such as Demerara animi or copal—Locust gum,—Hiowa or Incense gum, and Balsam copaiba has been more or less in a state of stagnation during the period. Other forest industries show little change.

Owing to the varying effects of the seasons it is not desirable to compare the exports of forestal products one year with another, and hence I prefer to compare them in periods of 4 years. The exports for 1917,

however, have to be omitted as having been very adversely affected by the scarcity of shipping. The periods taken for comparison are 1895-1898 and 1913 to 1916, and the records are:—

AVERAGE ANNUAL EXPORTS.

		1895-1898.	1913-1916.	Increase or Decrease Per Cent.
Balata, pounds	...	361,100	1,338,400	+ 270·6
Timber, cubic feet	...	273,400	225,400	- 17·5
Lumber, feet	...	42,450	339,600	+ 700·0
Shingles, thousands	...	1,607	2,255	+ 40·3
Charcoal, bags	...	58,000	60,400	+ 4·1
Gums, lbs. ...	...	2,730	1,060	- 61·2

The balata industry has very materially increased, due largely to the energy and great organising power of the present head of the Consolidated Rubber and Balata Company; taken together the wood-cutting industries—timber and lumber—have stagnated, or even somewhat decreased, but any decrease may be due to war-conditions; the demand for shingles shows a fairly satisfactory although not great, increase the openings for this product being somewhat restricted; the charcoal-burning industry is and has been in a state of stagnation; whilst the collection of gums appears to tend towards disappearance.

The Commissioner of Lands and Mines, his Forestry Officer, or Mr. J. Mullin is in a far better position to deal with the progress and probable future of these industries, and with the reasons for their increase, relative stagnation or decrease, than I can be, and I hope that one of them may favour us with an exhaustive paper on the forestal industries during the period of my present Presidency of this Society.

MINERAL RESOURCES.

The active interest in the mineral resources of the colony which the Society had shown in the early nineties had largely waned prior to 1897. Then the Institute of Mines and Forests was at its zenith and was doing really good work for the colony. But the alluvial gold-industry, the export of gold won by which had attained its maximum in 1893,—137,629 ounces of gold valued at £511,360—was already showing signs of decrease, the export having fallen to 126,100 ounces in 1896 and to 124,300 ounces in 1897. The export of raw gold with some fluctuations steadily decreased until that for 1913 was 99,194 ounces only. Of late the output of raw gold has been very adversely affected by war-conditions being 63,803 ounces in 1914, 53,907 ounces in 1915 and 36,245 ounces in 1916, whilst in 1917 only 29,015 ounces were exported.

During the period under review a few quartz-mining ventures have been carried on, the principal ones being the Peters mine on the Puruni River and the Barima mine in the North West District. The latter mine

was being worked in the earlier months of 1897 but temporarily closed down about the middle of that year. Both mines are now closed down, the former perhaps on account of the excellent and scientific exploitation by which the really payable sections of the reef—a quartz-aplite vein in a chloritic actinolite-schist—were removed and crushed, leaving only its relatively poor areas for future working; the latter because the reef split into a plexus of small quartz veins and threads as the workings reached a diabase-sill which traverses the country, there an altered aplite. The shaft was driven into the sill for several feet, but as the rock was there of coarse texture, indicating that the sill might be of considerable to great thickness, the working was abandoned.

Dredging for alluvial gold is being, and has been for several years, carried on successfully on the Konawaruk River and on the Mahdia and the Minnehaha creeks of the Potaro goldfields. Hydraulic workings were carried on for the exploitation of the gold in the weathered aplite and the laterites of Omai, Essequibo River; and in the weathered chloritic and sericitic schists at Tassawini on the Barama River. The former was very successful in its recovery of gold from the aplite; the latter did not meet with much commercial success in its exploitation of low-grade schistose material.

At first sight it would appear as though the prospects of our country for the future production of gold are gloomy in the extreme. This is not so; and I am satisfied that sooner or later after the termination of the war the prospects will very greatly improve. There are—there must be—other valleys in the vast interior of the colony having a structure similar to that of the Mahdia and Minnehaha valleys, a country of more or less auriferous aplite and aplitic granite intersected by the many feeders of one of the great sills of diabase which are so characteristic a feature of the interior of Guiana. The igneous and metamorphic rocks of the colony are practically all auriferous, carrying either original or far more usually secondary gold, the metal being of course present in them in only very minute proportions. The great geological age of the country has resulted in the destruction of the auriferous quartz-aplite veins with resultant concentration of their gold-content in their remnants. This has given rise to reefs exceptionally rich in gold at their present outcrops owing to secondary enrichment, but becoming non-payable or petering-out at depth. There must be other enriched masses and reefs not yet found to reward the future prospector. There are vast masses of auriferous aplite, closely allied to alaskite, in parts of which the gold-content has been concentrated to payable extent by the action of intrusive dykes of diabase, of other aplites or of micro-pegmatite. There are vast areas of ancient gabbros and norites,—now epidiorites, hornblende or chloritic schists,—with their gold-bearing debris, auriferous laterites. There must also be streams with payable auriferous gravels in their beds other than the Konawaruk, the Mahdia and the Minnehaha which will amply reward scientifically conducted dredging-operations.

The problem of the origin, concentration and distribution of the Guiana auriferous deposits is too complex to be dealt with in this address which has already far exceeded its prescribed limits. In 1897 this problem, if it had then been ripe for discussion, might have been dealt with at the Institute of Mines and Forests, but as that organisation no longer exists, except as a recruiting and registering agency for labourers for the interior, a paper on the question followed by a discussion would not be out of place in this room at some later date.

DIAMONDS.

Diamonds were first found in quantities in 1890 by Mr. Gilkes whilst working as a prospector for the late R. F. Kaufmann,—41 diamonds weighing 13 carats being brought to me for mineralogical examination on July 30th, and 518 weighing 198 carats being similarly submitted by Mr. Kaufmann on November 24th of that year but—little interest appears to have been taken in the occurrence of these gems in the colony by this Society. Although from 1890 to 1899 diamonds were found in many districts of the colony, usually singly or a very few in any one place, little was done towards the systematic working of the deposits until Mr. Gilkes, about 1899, succeeded in interesting persons outside the colony in their occurrence here. From that time the exploitation of diamonds has been one of the recognised industries of the colony. In round figures 136,400 carats of diamonds representing probably considerably more than a million crystals, have been won in the colony and exported since 1900. For that year the export of diamonds was returned at 996 carats. In 1902 to 1904 the average yearly export of diamonds was 10,720 carats. The output fell during the next three years, only 1,860 carats having been exported in 1907; it again slowly increased, the average annual export during the period 1911 to 1914 being 7,750 carats; whilst during the two years 1916 and 1917 the mean annual export increased to 16,580 carats. These recent records are encouraging and the exploitation of the colony's diamantiferous deposits promises to take an important part amongst its industries.

IRON-ORES.

There are vast surficial deposits of lateritic iron-ore in the colony, the ore invariably being characterised by its extremely low content of phosphorus and usually by a low content of sulphur. The utilisation of these wide-spread deposits is a problem of the future which I fear will have to await the economic development of the vast water-power potentialities of the cataracts on our rivers. There are also indications of magmatic deposits of specular iron-ore of a very high quality in the North Western section of the colony. Should any one of these latter deposits be proved to be of sufficient area it may soon become of export value.

BAUXITE.

Closely allied in origin to the lateritic iron-ore is the bauxite of the colony. The specimens which led to the discovery of the wide-spread

deposits of secondary bauxite in the Christianburg-Akyma district were obtained by me whilst President of this Society in 1897. With Curator J. J. Quelch as our guide, companion, and friend, I and my family spent some time early in that year in the district; Quelch as usual in search of zoological specimens, I enquiring into the physical nature of the soils. I by chance noticed the occurrence of small blocks and gravel of hard material all along the path from the riverside to the house at the summit of the low hill at Three Friends, Akyma. I also saw that the tiny model fort built by Commissary Thompson King whilst resident at Three Friends was made of it. I collected samples and asked Quelch if he knew what the stuff was. Quelch said that it was an indurated clay (exactly what it is) and that there were very wide areas of it in that district. A few days later Quelch and I recognised the same mineral at Christianburg in the foundation-wall of the saw-mill and along the course of the mill-stream. We also took samples from there. As I thought it was possible the concretionary mineral might be phosphate of alumina similar to that of Connatable, French Guiana, I afterwards analysed the specimens and found that although they did not consist of phosphate of alumina they contained exceptionally high proportions of a hydrate of alumina.

Thus to a chance visit of the then President of the Society, accompanied officially at the expense of the Society by the Curator of its Museum, the colony, and I may add, the Empire and her Allies, are indebted for the finding of the vast surficial deposits of bauxite of the Guianas. There is a most striking difference between the almost deserted toy-fort crowned hill at Three Friends, Akyma of 1897 and the busy hive of industry in 1918 which has been inaugurated there by the Demerara Bauxite Company. The summit of the hill has disappeared and its former site is now marked by a 1,000 feet of a working quarry-face of bauxite, some 16 to 18 feet in depth of the mineral being in course of exploitation.

All enquiries tend to prove that Demerara and probably Berbice and Essequibo contain vast reserves of this important ore of aluminium.

There are also in the colony deposits of manganese-ore, of similar lateritic origin to the iron-stone and bauxite, which have been found since 1897.

MICA.

There are deposits or pockets of white mica (muscovite) in certain of the pegmatite-dykes which emanate from the great masses of the muscovite-granite which occur in the near interior. The most promising of these masses as a source of mica is the Makauria—Kalacoon—Penal Settlement—Lower Cuyuni River granite. It is possible that the deposits in this district may prove to be of commercial value.

The pegmatites may also prove to be here, as in other countries, the sources from which supplies of rare minerals of great technical importance may be obtained. Their exploitation in search of such minerals is, however, a problem of the future.

LIGNITE.

Schomburgk during his journey in the thirties of the last century down the Corentyne River thought he had discovered the existence of carboniferous strata in Guiana. Recent investigations have proved that the fragments of coal he saw were not lignitic but are the eggs deposited there as a mare's nest years prior to his visit. They consist of pieces of water-worn bituminous coal. Pieces of bituminous coal, not infrequently water-worn can be found along the banks of the lower courses of several of our rivers, as for instance the Essequibo; and in places on the seashore and elsewhere. This condition also exists on the lower reaches of some of the rivers in the neighbouring colony of Surinam. These derelicts were thrown from the holds of ships, whilst loading timber, which had brought coal to Guiana. It is, however, not to these carboniferous mares' nests I am at present alluding, but to the fact that deposits of lignite are now known to exist on the Demerara River. Doubtless there are others in the colony. With modern methods for making "Producer-gas" it is probable that such deposits may become of some importance in our industrial pursuits.

MARES' NESTS.

Mares' nests are of somewhat common occurrence in the low-lands and along the foot-hills of the Guianas. Mineral eggs, with which many of them have been charged, have been frequently brought to me for examination during the period under review. Pieces of refinery and of bloomery or puddlers' slags, by-products of former processes for the manufacture of wrought-iron which doubtless arrived here as ships' ballast, have been brought to me doing duty as meteorites or as ores of some rare but unknown metal; blocks of coral limestone; pieces of Belgian black marble; fragments of black-lead pots (plumbago crucibles); pellets of lead of solder and of tin; small bits of antimony; quicksilver in small quantities; black and yellow spelters; lumps of pitch or asphaltum; water-worn, rounded pieces of pot-glass; chalk flints; and especially masses of lateritic bauxite have been among the numerous eggs I have had submitted to me. The wide areas over which these reliquae occur are remarkable.

Our Dutch predecessors not infrequently used bauxite, especially the harder ferruginous bauxites, for making the foundations of their buildings as it was the readiest available hard-stuff on the lower reaches of the rivers. Aboriginal Indians are responsible for many geological mares' nests either by their former practice of bringing shell-fish such as oysters in quantities to special places for their feasts (there is a mare's nest of ostrea-shells covering nearly an acre and in places several inches in thickness and situated about 2 feet from the surface near the base of the Issorora Hill, N. W. District) or by carrying large pieces of rock from one place to another to use as anchoring-stones for their corials. I mention these as in this colony every prospector and geologist must be constantly on his guard against the contents of such mares' nests.

PEGASS.

Large areas on the coastlands of the colony are covered with deposits of "pegass" or tropical peat. Usually these deposits are from two to five feet in depth but in places they exceed ten or even twelve feet. Pegass in a dry state contains from 45 per cent. of organic combustible matters in its ordinary varieties to as much as 90 per cent. in its more carbonaceous ones. The organic matters of pegass may contain from 1.4 to 2.7 per cent. of their weight of nitrogen. Thus a ton of dry pegass may contain nitrogen equal to from 140 to 250 lbs. of sulphate of ammonia. Unfortunately no mode is known by which all the nitrogen can be recovered as ammonia. Pegass should be utilisable in the immediate future as a source of producer-gas, with sulphate of ammonia and various other derivatives, for instance tar, as its by-products.

WATER.

This Society from time to time has shown interest in the various problems which have arisen in connection with supplies of uncontaminated water for household-purposes. During the period under review much attention has been directed in the colony toward obtaining supplies of potable water from underground sources. For several years the aquifers tapped in the numerous wells put down by the late Mr. T. Wardle were only the comparatively shallow ones yielding either very saline or highly ferruginous waters. The Mortality Commission of 1895 over which I had the honour to preside made a strong recommendation that deep bores should be put down in the hope of tapping supplies of uncontaminated water. The Drought Committee of 1912 strongly pressed on the Government the desirability of a practical trial with the result that the first deep artesian bore was put-down in 1913 in the environs of Georgetown on the D'Urban Park. That boring was successful beyond all expectation and is still in full flow. Since then over 20 deep artesian borings have been put down. The usual difficulties met with where borings for artesian water are put down on recent alluvial or deltaic deposits on sloping artesian planes with regard to the permanency of the yield of water from the wells have been experienced here. These have not yet been overcome, but doubtless in a short time our engineers will have got the better of them, and will have placed us in a position of security with regard to the permanency of the artesian flowing-wells.

In 1897 we knew that in the alluvium there were sandy beds yielding either saline or ferruginous waters, some possibly of medicinal value, and at the suggestion of the Society analyses were made in that year of the waters yielded by the various wells which had tapped them. Now we know that practically everywhere under the inhabited parts of the coastlands of the colony there are vast artesian reservoirs of pure and uncontaminated potable water. These, however, vary in depth from the ground-level from about 300 feet in North East Essequibo to not less than 500 feet in the middle and south east of the colony. As a rule, to which at present we have not found any exception, the waters in

aquifers tapped at greater depths than 500 feet are exceptionally pure and uncontaminated, the sole objection to them being their iron-content, which, however, is usually less than a grain of ferrous iron to the Imperial gallon. An unlimited supply of uncontaminated underground water is one of the most important mineral resources of any country and this is now known to be a characteristic potentiality of British Guiana.

WATER POWER RESOURCES.

The vast water-power resources of British Guiana have not hitherto received the attention they deserve although they are among the most valuable of the potentialities of the colony. The great falls and the long-extended series of cataracts on several of its large rivers must in time attract the attention of capitalists, electrical engineers and technologists in search of water-power and then be utilised as sources of electric energy. That energy will be employed as power in quartz-mining and gold-milling, in hydraulic installations and in dredging-plants for the exploitation of the still very extensive placer gold-deposits, for power in connection with the timber-industries, as a motive force for the railway we trust will traverse the interior and possibly as a source of heat and chemical energy in reduction-plants for aluminium, iron and perhaps other metals.

TOPOGRAPHICAL AND TECHNICAL SURVEYS OF THE INTERIOR.

It is admitted generally that in this present time of stress we cannot look for any immediate flow of capital to the colony with the object of developing its great resources by supplying it with modern means for travel and general transport. Are we justified in resting content in the hope that at some future period some prominent financial magnate, thirsting for opportunities of investing his surplus monetary accumulations, may discover the colony, personally enquire into its resources, map it out, and proceed to develop it,—not for our benefit but for his own? In my opinion this is the time when colonists should be taking steps towards accurately extending the world's knowledge of their country. A topographical and technical or economic survey of the country is an absolute necessity before any steps can be taken with reasonable security for its development. We know a little—a very little—more of the potentialities of the country than we did in 1897, but in reality we do not know much more than was known, or suspected on reliable grounds, about them in 1851. Our present maps are largely sketch-maps, and thus cannot serve as reliable guides for the details of the country for would-be investors. A detailed topographical survey of the interior of the colony is a crying necessity at the present time; it should be supplemented by mineralogical and forestal reconnaissances, carried on in greater or less detail as conditions require, and thus the survey would become, as it gradually approached completion, one of the most important assets of the colony. A commencement is being made this year by a survey of portions of the northern section of the colony which are regarded of promise in connection with bauxite and other minerals of economic importance; but there

is already evidence that this enquiry will be very greatly hampered by the absence of reliable detailed maps of the parts of the country which are to be examined.

It may and probably will be objected to this address that it is too long and covers, although only cursorily, an unduly wide range of subjects. It is, however, impossible to glance at the agricultural and industrial changes which have taken place in the colony during 21 years in a short address. I have tried not to wander beyond the aims and objects of this time-honoured Society. These objects are defined in the preamble to the Royal Agricultural and Commercial Society's Ordinance No. 2 of 1866 in the following words :—

"The objects of the said Society are to promote, as far as possible, "the improvement and encouragement of the agriculture of the Colony, "and of every branch of industry, whereby the resources of the Colony "are likely to be developed and increased, as also the collecting and "disseminating of useful information on such subjects." Chapter X, Clause 3 of the First Schedule of the Ordinance, mentions that among the duties of the Society's Standing Committees is the "forming and "maintaining a Local Museum and an Experimental Garden," and Chapter XIII, Clause 2 enacts that: "In the Museum shall be kept the "best specimens which can be obtained of the production of the Colony, "both indigenous and introduced; more particularly specimens of "minerals, soils, woods, fibres, fruits, seeds, gums, resins, dyes and drugs, "and of all other productions of the Colony which either have been or "may hereafter be successfully cultivated or used as articles of commerce "or of food;" whilst Chapter XIV, Clause 1 lays down that :—"Premiums "may be offered for improvements in the agriculture of the Colony; for "the application of manures to the cultivation of the soil; for improved "methods of clearing and draining land; for the improvement of pasture "lands; for the improvement of implements and machinery; for the "improvement of existing, and the introduction of new and improved "breeds of horses, cattle and stock of every description;" and Clause 2 states that :—

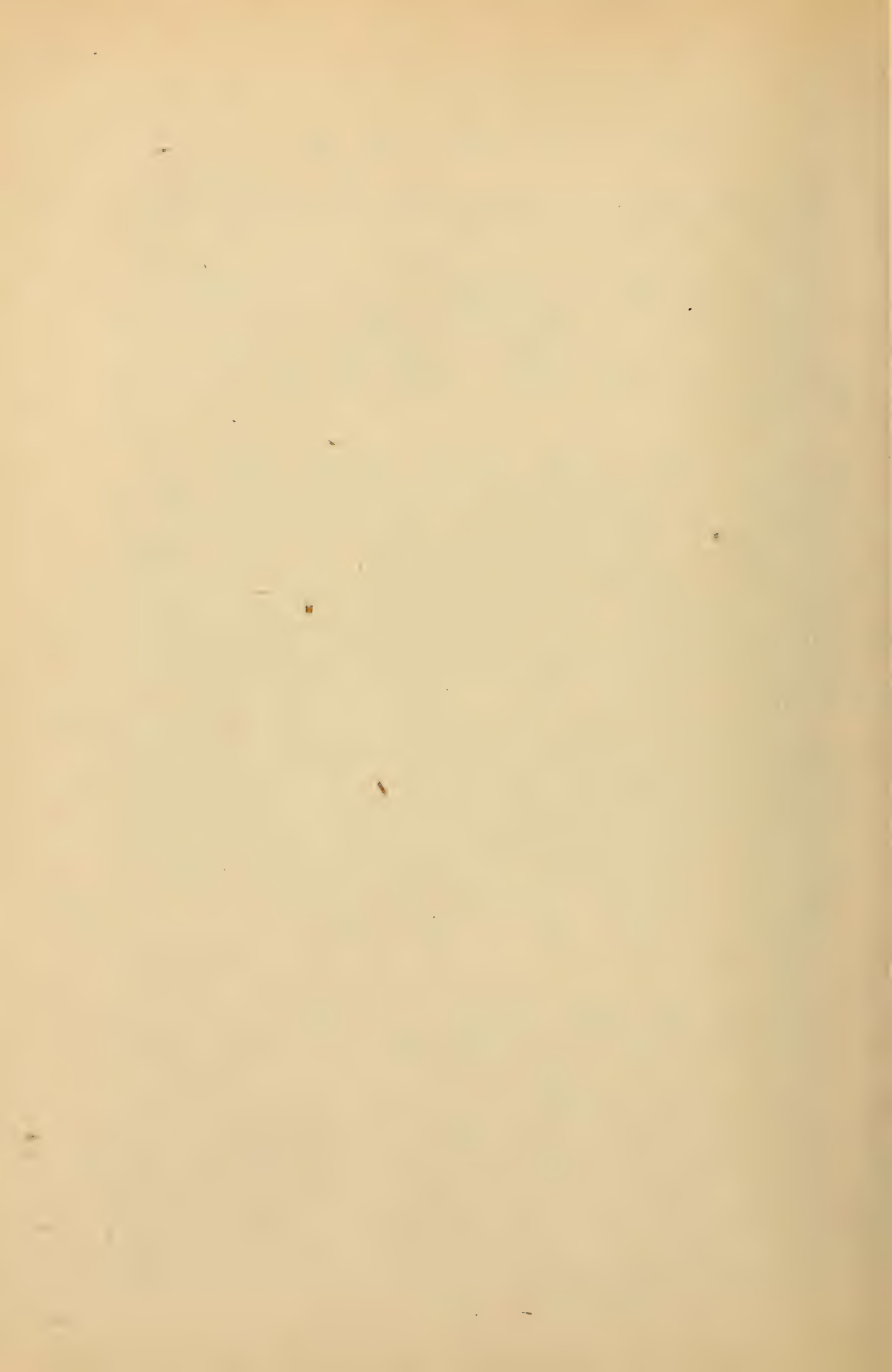
"Grants of money to aid in useful experiments of any kind, such as "the testing of the utility of new inventions, the chemical analysis of "soils, and other purposes, may be also given by the Society."

These show that the objects of the Society embrace a wide range of agricultural, industrial and scientific subjects and hence the address of its President may perhaps be permitted to traverse, as I have done, a similarly wide range. It was not the fault of the Directors of this Society that when the Botanic Gardens and the present Government Laboratory were inaugurated in 1878 and 1879 they were not placed, as the Directors desired they should be, under the control of the Society as the colony's other scientific institution—the Museum—has always been. Hence the activities of the Department at present under my

charge as they are very closely connected with, and indeed covered by, the objects of the Society as laid down by its Ordinance should be of interest to such of its members as are not members solely on account of their desire for ephemeral literature. By our Ordinance we are charged with "the improvement and encouragement of the agriculture of "the Colony, and of every branch of industry, whereby the resources of "the Colony are likely to be developed and increased," and hence when in this address I have deviated from the prime object of this Society—agriculture—I submit I have still kept within the wide limits of "every kind of industry."

It is the duty of the Society as a whole and, I consider, also that of every one of its members to keep in mind the wide objects which justify its existence; and, for the latter—whether engaged in agriculture, in the forestal industries, in the exploitation of the colony's mineral wealth, of its means of communication, the utilisation of its vast water-power resources, or in commerce—to approach this Society with regard to the development of the Colony's assets in such a manner as to ensure its being, as the Society's founders intended it to be, the foremost organisation of the colony working steadfastly with the Government towards not only its economic development of this Magnificent Province, but also the social and general welfare of its inhabitants.

Is the Society through the co-operation of its members at present occupying the proud position it ought to do in this respect? I fear the answer must be that it is not and that it has not at all satisfactorily responded to the strenuous and persistent efforts its out-going President, Dr. Nunan, has devoted in the hope of inducing the Society to attain the foremost position it should occupy in the practical affairs of British Guiana.



GLIMPSES OF THE GUIANA WILDERNESS.

A. HYATT VERRILL.

Your Excellency, Mr. President, Ladies and Gentlemen :

It is a great deal easier to show interesting pictures than to say interesting things, and I have no doubt you would rather see my pictures than to hear me talk, so I shall try to show as many slides as I can and say just as little as possible.

The only trouble has been to select the pictures, for there are so many interesting and remarkable places and things to be seen in this colony that it's a mighty difficult matter to pick out the most interesting. Moreover, I have had but four days in which to select my views, have the slides made and colour them, and hence I am limited in the number I can use.

Every part of the interior is so different from every other part that in order to obtain an intelligent idea of the country, one must travel here, there, and everywhere. So I shall give you glimpses of various places and shall jump from spot to spot, regardless of time or distance.

It may be just as well to begin near home and I will start with the most important river, from a commercial viewpoint,—the Demerara. My first view is a typical scene on the Demerara River, a timber raft floating past Christianburg with its saw-mill in the distance. The only motive power of this craft is the tide, the long sweeps being used merely to guide the raft, and by this slow and tedious method the lumber is floated down to the coast from the distant forests of the hinterland.

The next slide shows a man felling a greenheart tree. Note the staging built about the tree so the chopper may work above the out-jutting, buttress-like roots. As yet the timber resources of British Guiana are scarcely touched, and there are vast forests full of valuable trees which are now worthless, owing to the difficulties of transportation, and which would prove a source of great wealth if railways were in operation.

Another picture shows one of my camps in such a section. From my hammock in this camp I counted 55 greenheart trees, every one of which would have squared to 18 inches or larger.

This next picture is not a parody of "Washington crossing the Delaware," but shows the people of Mallali going to church. For some unknown reason the church is on the opposite shore of the river from the settlement and the devout Mallalians risk a ducking every time they attend services. It looks as if these people had solved the problem of getting a quart into a pint, even if their pint is a punt.

armadillo. Each dancer bears a different animal and in the dance is supposed to go through the antics and make the noises typical of the creature he represents. One can imagine the difficulty this man would have ; think of trying to make a noise like an armadillo, or a lizard, or o imitating a sloth !

Here is another Acawoia in a very different costume, that of the parasara dance, and which is made of palm leaves. This is probably the only photograph ever taken of an Akawoia wearing this costume. During the dance the head covering is turned down and conceals the wearer's face. The object in the left hand is the dance drum and that in the right is the rattlestick. After the dance the suits are hung upon fallen trees in the rivers or on stumps in the fields to keep off evil spirits.

But dancing is only a very small part of an Indian's life. He must hunt and fish, fell trees for fields to plant, build his houses, make baskets and weapons and perform many other duties, for despite popular belief, the Buck is not an idler until he is Christianized and civilized, and the women do no more than their share of labour. It is their duty to till the fields, prepare food, spin cotton, weave hammocks and rear the children. The principal food is cassava and the preparation of this staple is very interesting. In the picture is seen the first step in the process, a girl grating the roots on a grater made of a board into which bits of stone are fastened with cement-like wax.

The next step is to remove the poisonous juice from the pulp, which is done by means of the metapee, as illustrated in this photograph. The pulp is placed in the metapee which is then suspended and is stretched out by means of a lever and a woman's weight. The juice extracted is preserved and used in making cassareep and starch.

Next the compressed material is broken up and made into a coarse meal by rubbing it through a basket work sifter, as shown here, after which it is spread in round, thin cakes on a stone or iron and baked over a slow fire, as is illustrated in this picture.

How the Indians first discovered that a deadly poisonous root could be transformed into a nutritious food is one of the unsolved puzzles of Indian history. Certainly it could not have been by experiment, for the experimenters would have succumbed to their experiments long before they discovered the process.

This slide shows another Indian woman at another of her daily tasks, squeezing sugar cane in a primitive mill consisting of post and lever.

The women also do a great deal of the droghing and they carry as large or even larger loads, than the men. Here is a girl with a 140lb. load ready for a 20-mile jaunt over a mountain. I was anxious

to see how she descended the steep mountainside, bowed under her load, but she soon outdistanced me; the load apparently not inconveniencing her in the least.

To many people all Bucks look alike; but in reality, every tribe has distinct characteristics by which its members may be recognized. The pictures I have shown are all of Akawoias, a tribe peculiar to British Guiana. Very different are the Caribs shown in this picture. In many ways the Caribs are superior to all other tribes of Guiana. Their women are the only ones who do not wear the bead aprons or queyus, but instead use cloth laps. The men's laps are also distinctive, being ornamented and fringed, but the most characteristic mark of the true Carib is the tuft of white King Vulture down worn on the forehead, as may be seen in this photograph.

Returning to Bartica, we'll start off on another trip up the Essequibo. Nowadays few people travel up this river from Bartica on account of the dangerous falls between Bartica and Rockstone. It was to avoid these that the railway was built from Wismar across to Rockstone. But I have made the trip several times without mishap and think it one of the most interesting and exciting trips in the colony. When Mr. Runcie was here I carried him by this route to Kaietuerk Falls, for one of the principal objects of his visit was to film the boat trip through the Essequibo rapids, which I described in *Harper's Magazine* for January. This slide shows how our boat was hauled through an enormous whirlpool, while the next view shows the men building a rude palm-leaf shelter or "bush-tent" over the boat.

On the islands in the rapids of the Essequibo are many beautiful orchids. Here is a photograph of a fine specimen with over 180 flowers on one plant, while the next view shows a spider monkey on a dead tree being "filmed." A nearer view of the unwilling subject shows it trying to "look pleasant."

Among the most striking and typical features of the tropical forests are the "bush ropes" or lianas. The picture shows how large these vegetable cables grow and also how they are attached by roots to the trees and grow downwards. How these gigantic vines grow is often a puzzle to those unfamiliar with them. One gentleman told me he couldn't understand how slender vines could sprout straight up through the air and catch hold of a tree a hundred feet above the earth.

Having passed safely through the falls the traveller arrives at Rockstone, of which I show a view, and here I obtained some very remarkable pictures on my last visit, for I had the good fortune to see Indians eating "Cooshie ants." These ants swarm but once a year and the Indians consider the big, winged females, or queens, a great delicacy. It was a wonderful sight to watch the Indians hopping about among the ants, their legs streaming with blood from the bites, while they caught the queens and pulled off wings and jaws. When a good supply was gathered they

retired to a safe distance and munched the ants in comfort. It was a sight few men have witnessed for queen Cooshie ants are so rare that only a few specimens are preserved in the great museums. To find a nest of swarming Cooshie ants and Indians on hand to eat them, was a coincidence little short of marvellous. The ants taste like condensed milk I discovered.

At Rockstone we were joined by Father Cary-Élwes and his Makushie Indians who accompanied us as far as Kaietuerk where he left us and continued on to his distant mission.

Never have I travelled with a more enjoyable companion, for Father Cary-Elwes is a most lovable, a most human and a most remarkable man. Throughout his wanderings in the wilderness he has not missed Mass in seven years and every morning a rude altar was erected, and Father said Mass for his three Makushies. Very impressive was this simple service in the dim forest with the pink sky of dawn overhead and the silvery chimes of the Bell birds ringing from the tree tops.

My next picture shows a bit of the Potaro River from the Tumatumari rest-house. Tumatumari is a beautiful spot with the four cataracts, separated by wooded islands, just beneath the rest-house windows. It could be made into the most attractive winter resort in the tropics, and if provided with adequate accommodations and easy and rapid transportation, it would draw countless visitors from the north, especially if a road was constructed from here to Kaietuerk.

People, who have never been far from the coast, are prone to think of British Guiana as a flat country, but a trip up such a river as the Potaro will dispel all such illusions. Here great mountains rise on every hand, often with their summits hidden in the clouds.

Kukuieng (Hawk's Nest) is perhaps the most striking, owing to its castle-like form, but there are scores of others just as lofty and just as massive, and all converging to form a fitting gateway to the world's greatest cataract.

At Pakutuerk we accomplished the impossible and pulled our boat up through the falls and at Amuktuerk we found a big camudi coiled upon the rocks at the landing place as if waiting to welcome us. After being duly "filmed" he was killed and proved a good load for five husky Indians, as shown in the picture. He measured 18ft. 9in. in length, 29 inches in circumference and weighed 280 odd pounds.

Still another bit of luck was in securing this picture of a crocodile basking beside a pool, while a still more striking picture was obtained when, in hauling through a particularly bad stretch, we had as neat a washout as anyone could wish. It wasn't nearly as much fun at the time as it seems now, however.

But despite such little inconveniences we reached Tukuit safely in due time. Tukuit is in the midst of magnificent scenery and directly across the river from the rest-house a cataract springs from the verdured mountain crest and plunges down for hundreds of feet to the forest above the clouds. This in itself would be considered worth the entire trip in most parts of the world ; but in the presence of mighty Kaietuerk it pales into insignificance.

It's a fearful climb up the mountain-side to the plateau, and it's a shame that the way has not been improved and a road built from Tumatumari to the falls. Even a decent path from Tukuit would be a great improvement. As it is, one has to scramble and even crawl for several miles up a stony, slippery, log-choked, fissure-filled gully at an angle of about 60 degrees. In Kaietuerk you have an asset worth millions, a sight which should attract visitors from every corner of the earth, and yet, nothing to speak of has been done to exploit it or to bring it within reasonable reach of Georgetown. To be sure, Sprostons have advertised it and have attempted to attract visitors to it, but the service is so poor and the cost of the trip so unreasonable that it is practically prohibitive and only a man who has unlimited time and money at his disposal, and doesn't mind discomforts can afford to undertake the journey under present conditions. With a decent road Kaietuerk is scarcely two hours by motor from Tumatumari, and yet one must travel afoot and by boat for two or three days to cover the distance. Moreover, if modernly fast steamers or launches were operated on the rivers and a motor road was built, these stupendous falls, which have no equal in the entire world, could be brought within a day's travel of Georgetown. And it wouldn't cost a fortune to do this ; fifty thousand dollars would be amply sufficient, and a mighty good investment it would prove. Imagine leaving town at 7 a.m., travelling through marvellous tropic scenery and dining on the plateau beside the falls at 7 p.m. the same day !

As a money maker I would rather have Kaietuerk than all the gold and diamond claims or all the timber lands, in the colony.

On the way up from Tukuit we stopped some time to admire and study those wonderful birds, the Cock-of-the-Rock. Several specimens were obtained for the purpose of preparing a group for the museum, which is now on exhibition, but we saw over 20 of the birds within a distance of half a mile. Their presence here was particularly interesting, as they were supposedly extinct, save in the most unfrequented and distant parts of the Colony. Since then I have found them nesting within one hundred miles of Georgetown.

When at last one reaches the plateau at the end of the climb one looks upon a totally different land from that below ; a barren expanse of naked rain-worn rock with great lily-like giant bromeliads, strange orchids, nodding blue hair-bells and bracken ; a flora peculiar to the plateau and unlike anything else.

But all interest centres on Kaietuerk and we hurried across the plateau to the brink of the gorge to gaze for the first time upon this titanic waterfall. All my life I have prided myself upon being able to look down from dizzy heights without any sensation of giddiness or fear. I have climbed to the trucks of ships' masts at sea; I have gazed from the skeleton frames of skyscrapers at the ant-like humans in the busy streets five hundred feet below, and I have stood on the brink of many a terrific precipice; but when I walked boldly to the edge of Kaietuerk gorge I gave one glance and beating a hasty retreat sat down at a safe distance.

I expected to look down for a vast distance; but I also expected to see a slope or a precipice, or some tangible connection between the top and bottom of the gorge. Instead I gazed straight down through space for a thousand feet and I could not overcome the sensation of the entire overhanging ledge tumbling into the awful abyss beneath. The feeling soon wore off to large extent, however; but still I preferred to get down on all fours, or hold on to a bush when near the verge.

In all the pictures of Kaietuerk the falls appear dwarfed and disappointingly small, but this is due to the fact that there is nothing for comparison and one has the same feeling, the same lack of power to grasp the size of things, when actually looking at the falls. The valley far below seems clothed with soft, green moss dotted with pebbles and not until you realize that the seeming moss is a forest of giant trees and the apparent pebbles are great masses of rock weighing hundreds of tons each, do you realize the stupendous size of the falls and the depth of the gorge.

So high are the falls that not an atom of real water ever reaches the pool beneath, the falling mass being transformed to vapour long before it reaches the end of its descent and looking far more like volumes of smoke than liquid.

But to obtain a true idea of the size of Kaietuerk note the man in the picture. Once we realize that this speck is a human being the stupendously overwhelming proportions of the cataract are impressed upon us.

I mentioned my sensations when looking over the brink of the gorge but Father Cary-Elwes was absolutely unconscious of any such feelings. He was anxious to secure a picture from a certain viewpoint and approached nearer and nearer the edge, finally planting his camera with one tripod leg resting on a jutting pebble beyond the verge of the plateau. Then all forgetful of his surroundings, he stooped down to adjust his lens with his back to the gorge and actually balancing on one foot on the very brink of eternity.

I have been asked by many to give my impressions of Kaietuerk, to describe the falls; but there are things which defy description and one of these is Kaietuerk, for words utterly fail to convey any adequate idea



MALALI PEOPLE GOING TO CHURCH.

(1)



GOLD DIGGERS LEAVING BARTICA.

(2)



PENAL SETTLEMENT.

(3)



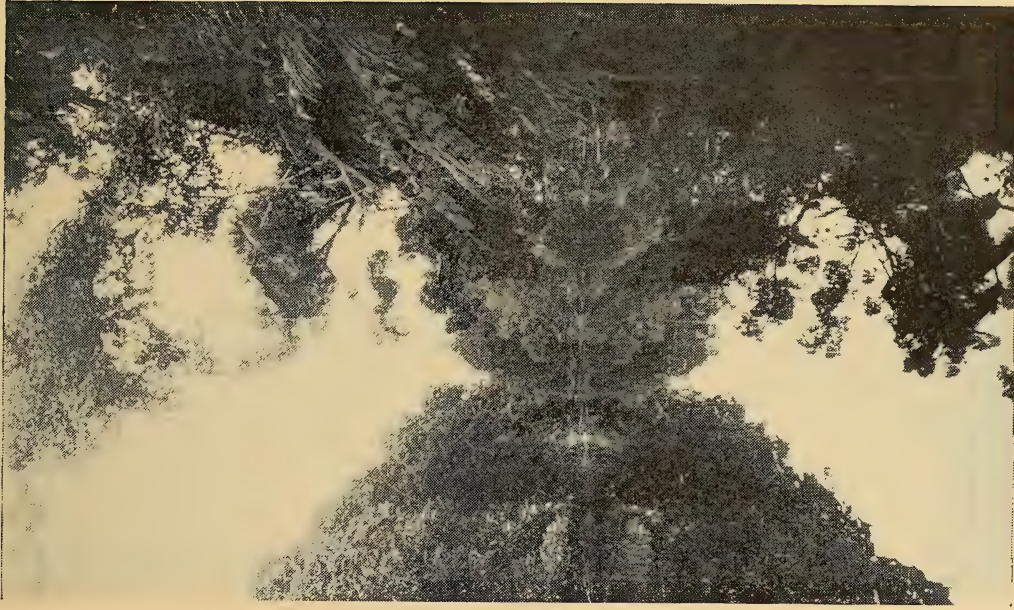
RUNNING A RAPID.

(4)



PANNING GOLD.

(5)



VIEW ON BONASIKA, SHOWING REFLECTIONS.

(6)



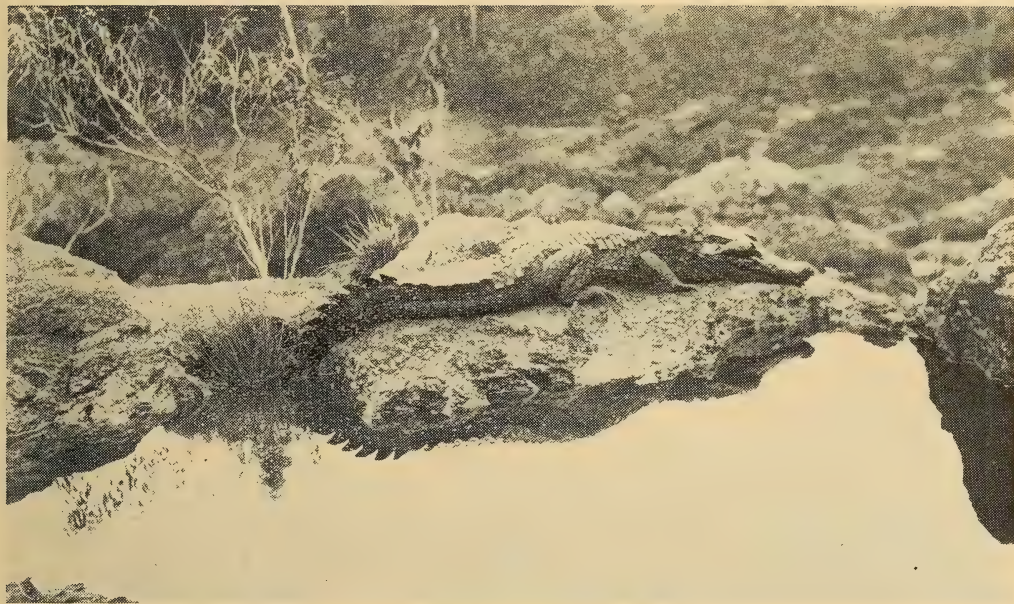
HAULING UP A WHIRLPOOL IN THE ESSEQUEBO.

(8)



TUMATUMARI FALLS, FROM REST HOUSE.

(9)



ALLIGATOR BASKING IN THE SUN.

(10)



A WASHOUT AT PAKOUTOUT FALLS.

(11)



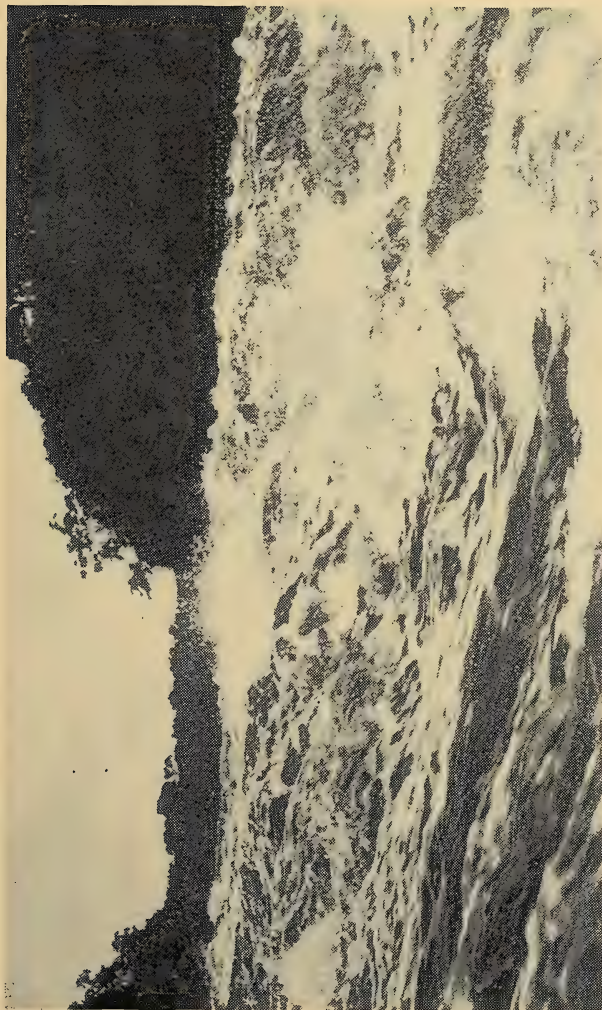
KAIETUERK FALLS.

(12)



KAIETUERK GORGE FROM BRINK OF FALLS.

(13)



POTARO RAPIDS.

(15)



(16)

(17)

15. CRAPAUD ROCK, MAZARUNI RIVER.

16. AKAWOIA IN FULL DANCING COSTUME.

17. DITTO. IN PARASARA DANCE COSTUME.



(18)



(19)

18. INDIAN LOOKING DOWN FROM VERGE OF
KAIETUERE FALL.

19. FATHER CARY-ELWES SAYING MASS IN THE
FOREST.



GRATING CASSAVA ROOTS. (20)



BAKING CASSAVA CAKES. (21)



ANT-BEAR, SHOWING TONGUE. (7)



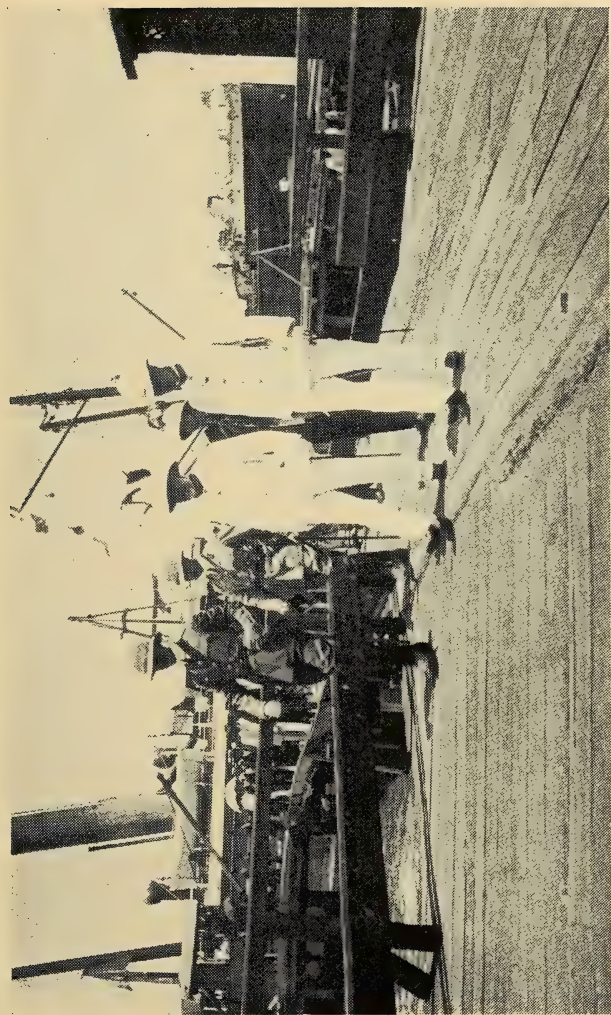
SIFTING CASSAVA MEAL. (22)



PRESSING CASSAVA IN MATAPEE. (23)



INDIAN LEVER SUGAR MILL. (24)



LANDING OF THE NEW GOVERNOR.

of the overwhelming grandeur of the falls and gorge. It is one of the things which must be seen to be realized and the finest pictures seem woefully poor and insignificant after viewing Kaituerk itself. It cannot be truly described as beautiful, rather it is awe-inspiring, sublime, almost terrifying in its grandeur. It is the very epitome of inconceivable power and titanic strength, immeasurable, irresistible, incomparable. In its presence one feels puny, helpless; a mere atom, and gazing upon it, one is filled with quaking, unreasonable dread and yet is fascinated, as by some gigantic savage beast of magnificent form and perfect grace.

Perhaps the greatest attraction of Kaietuerk is that it is never twice the same. Every moment it changes; with every breath of wind, with each variation of light, with every passing cloud it assumes a different aspect and to reproduce these in photographs is impossible. And then there is the colouring, for Kaietuerk is no foam-white cataract, but plunges over the verge of conglomerate in a mass of golden brown and amber which changes to cream and pink and saffron as it falls while the rising vapours veil it in clouds of prismatic hues, or bar it with a glorious rainbow.

In some respects the gorge itself is even more beautiful and impressive than the cataract. Here is a view looking down the gorge from the brink, while the next picture shows an Indian poised on the verge of the falls and wrapped in contemplation of the wondrous scene stretched out beneath him. And truly the scene before him is one of surpassing beauty. From beneath his feet at the base of the mighty falls, stretches the great gorge to where its sides are lost in the blue haze of distance. In the very centre winds the silver thread of river, flecked with the white of rapids, while on every side rise frowning precipices cut with black ravines and topped by vast plateaus and everywhere covered with the endless forest of a thousand shades of green; purple in the shadows, golden in the sunlight; a panorama such as few spots in the world can boast.

On our return journey from Kaietuerk we ran everything, even Pakutuerk, and only streaked through the very worst spots.

Some idea of our speed may be gained from the fact that it took but four hours to run through rapids where we had spent four days hauling up. So accustomed did we become to running dangerous falls that when we reached Tumatumari we ran them also, a feat never before attempted as far as I can ascertain.

But despite all the beauties, all the wonders of the interior, one is always glad to reach civilization after weeks in the wilderness, and yet there is a strange fascination about the bush, a charm about the great, silent rivers, a something that grips one and makes one long for the wilderness, for the hammock swung under the tarpaulin in the forest, for the glow of camp fires, the smell of pungent smoke and the glorious

sunsets reflected in the mighty rivers. Whenever I'm in the bush I long for civilization and just as soon as I reach town I'm just as anxious to get back in the bush.

It is a marvellous, a wonderful land that you have here in British Guiana, a land of untold wealth and resources, of magnificent scenery and of vast possibilities. Development is all that is needed to make it one of the richest countries on the globe. Sooner or later that development will come and then British Guiana will take the place it deserves. Let us hope that my last picture represents the beginning of a new era of prosperity for the magnificent province.

PREHISTORIC MOUNDS AND RELICS OF THE NORTH WEST DISTRICT OF BRITISH GUIANA.

A. HYATT VERRILL.

There are two distinct types of Indian mounds in the North West District of British Guiana, the first consisting of immense accumulations of shells on the lowlands near the coast or estuaries; the other formed of masses of shells superimposed on the hills and often many miles from the present sea coast or rivers. The former are more common in the Pomeroon and Moruca districts than in the true North West and are nothing more than "kitchen-middens," accumulations of refuse from feasts and temporary camps, and throw little or no light upon the habits or identity of the makers. Several have been excavated and accounts of their contents have been published by Brett and others. Such stone implements and pottery as they contain were either accidentally mislaid or cast aside as worthless by their owners while the human bones are evidently the remains of cannibal feasts.

The mounds of the other type are, I believe, confined entirely to a limited area in the extreme North West and have not hitherto been investigated to my knowledge.

In addition to these shell mounds there are many high hills in the district, on which there are no shell accumulations, and on the surface of many of these are large numbers of relics in the form of stone implements, earthenware images, ornaments and miniature heads and fragments of highly decorated pottery. The presence of these relics has never been satisfactorily explained but they have usually been attributed to Carib occupancy and it has been assumed that the pottery was the remains of broken and discarded vessels from ancient camps or villages. From a careful study and investigation of these mounds and relics carried out during July and August, 1917, I am convinced that this theory is erroneous, while excavations in the mounds of the district led to many remarkable and valuable discoveries which tend to bear out my theories and shed new light on the prehistoric inhabitants of North West British Guiana.

It often has been thought that the shell mounds and pottery of this district were of post-Columbian origin and while this may be true of the coastal kitchen-middens it is certainly not the case with the hill mounds and decorated pottery of the North West, for these were made when the entire district was covered by the sea and the present-day hills rose as islands from the waves. In proof of this there are numerous undercut and wave-worn ledges and boulders, as well as small areas of sea beaches and shell sand beneath the thin layer of vegetable mould and alluvial soil on the bases of the hills. Moreover the immense quantities of sea-shells which comprise the mounds could not have been transported for any

great distance from the sea, or from streams leading to the sea. Finally, the shells are mainly *Neritas* (periwinkles) oysters, *Strombus* (conchs) and a few other bivalves and univalves, all of which are species inhabiting rocky or sandy shores and never found on the muddy coasts and in the brackish estuaries of British Guiana at the present time. It may be argued that the Indians brought these edible molluscs in canoes from Trinidad or the northern islands, but this is a theory far-fetched and untenable. In the first place the shells would have spoiled and become inedible long before they reached Guiana's shores; in the second place the Indians would never load down their boats with useless shells containing a very small amount of edible flesh and finally we are confronted with the fact that many of the largest deposits are many miles from *any watercourse* and are buried in the heart of the dense forest.

The stupendous number of sea-shells which form these mounds is almost incredible and proves that either a very large population once inhabited these island hills or else that large villages remained undisturbed for a vast number of years. On Barambina Hill, for example, the deposit of shells (mainly small *Neritas*) covers an area of over 150ft. x 300 ft. and with an average depth of five feet or something over 8,333 cubic yards. Tests proved that the shells weighed an average of 70 lbs. to the cubic foot and that each pound contained about 300 shells. Hence, in this one mound there must be fully five billion shells weighing approximately 8,000 tons.

And this is only one of scores of such mounds, for I have traced the accumulations on hills for over 70 miles from the present sea coast. At first one can scarcely believe that these shells have remained here for centuries, for many are almost as bright and fresh as when first gathered, but at a short distance beneath the surface they become semi-fossilized and cemented together by carbonate of lime into a hard, stony mass. This fact rather points to the assumption that the mounds were accumulated slowly and through many years rather than being the result of a large population remaining in one spot for a comparatively short period.

The identity of the race which made these mounds is a mystery for, as I shall point out in the following paragraphs, they certainly antedated the kitchen-middens of the coastal districts and were not of Carib origin as the latter are supposed to be. A great deal of time would be required to investigate all the known deposits and mounds in the district and no doubt there are many still unknown and hidden in the dense forests and swamps; but there is no reason to think that they differ materially from those visited, although much additional information and valuable material might be obtained by a systematic and scientific study of the relics. It is to be regretted that the Colonial Government has never taken sufficient interest in its Aboriginal inhabitants to carry out an exhaustive investigation of both the prehistoric and living Indians.

The hills and mounds which I have excavated and studied are as follows :

Kobarima Hill, Barambima Hill, Akawabi Hill.
Kumaka Hill, Ossororo Hill, Waunina Hill.
Koriabo Hill, Mts. Everard and Terminus.
Anabisi Hills, Manibari Hills, Hotakwaia Hill.
Hobo Hill, Simri Hill, Hanaida Hill, Hotahanna Hill.
Maruiwa Hill. Unnamed hills in the district.

Of these only the following bear shell mounds : Barambima, Akawabi, Hobo, Simri, Hotahana, Ossororo, and small hills between Kumaka and Barambima and between Waunina and Akawabi.

But decorated pottery, miniature heads, images and highly finished stone implements were found upon nearly all the others. Only on one hill (Akawabi) did the shell deposits and decorated pottery occur together.

BARAMBIMA HILL.

This is a low hill, about 100 ft. in height, at the western terminus of the irregular range known as the Aruka Hills and which abuts upon the Aruka River at Kumaka Hill. It is of granitic formation* with some lateritic iron stone, and is covered with heavy forest and deep, rich soil. The shell deposit covered the extreme western slope and occupies an area of approximately 150 x 300 ft. At this spot the forest becomes stunted and more open—no doubt owing to the shells—but no trace of former cultivation of economic trees or plants could be found. A careful search failed to reveal any fragments of decorated pottery, any earthenware heads, or any stone implements upon the surface.

Excavations were carried on in the form of deep pits penetrating the shell deposits and reaching the subsoil beneath, and also by long trenches carried to the depth of the shells and extending completely across the mound. (Fig. 1) Near the surface many fragments of plain and poorly-made pottery were found and these continued to the bottom of the shell deposits. A few very crude stone implements were also unearthed. (Fig. 2) These consisted of some spindle-shaped objects,—probably ornaments,—rude celts or axes and a spear or arrow point. In three places complete human skeletons were uncovered. In each instance the body had been interred in a sitting or kneeling posture facing the east and in every case a rough slab of earthenware had been placed over the occiput. This slab was scarcely more than three inches below the surface and in one case the soil had been washed away leaving the slab and skull exposed. The bones were undisturbed and *in situ* but were so badly decomposed and so friable that it was impossible to remove any save the larger bones intact, while the skulls crumbled and broke despite the utmost care. Enough material was preserved, however, to afford an excellent idea of the

*The term "Granitic" as used here is not intended in its strict geological sense but is applied to all rocks and formations not of iron-stone or lateritic formation.

type of man buried in the shell mounds, a type with heavy, thick skull, devoid of visible sutures, projecting heavy orbital ridges, extremely low forehead, strong-pointed jaws and eyes close together. The dentition is also interesting, the molars being out of all proportion to the premolars which are abnormally small. (Fig. 3)

There were no traces of human remains devoured at cannibal feasts and the only bones, aside from the regularly interred skeletons, were those of fishes, birds and reptiles.

KOBARIMA HILL.

This is a high isolated hill about four miles south of the last and situated near the head of Kobarima Creek about three miles from the Aruka River. It is composed mainly of laterites with some granitic rock and is one of the so-called "red hills" of the district. It is covered with a sparse growth of low trees, has little depth of soil, except on its northern slopes, and is at present inhabited by a few Warrau and Arowak Indians. No traces of shells were found, but on its highest, and most barren portion, I obtained a few earthenware heads and two pieces of partly worked stone. (Fig. 4)

WAUNINA HILL.

This is a lofty (225ft.) hill on the northern banks of the Koriabo River (tributary of Aruka) and dwindles down to the west to the low Akawabi Hills. It is composed largely of laterite, has little fertile soil over a considerable portion of its surface and is a decidedly "red" hill even when viewed at a distance. Here a few very fine stone implements were obtained, as well as several earthenware heads and numerous pieces of highly decorated pottery. (Fig. 5-6) No traces of shell mounds or former village sites could be found.

AKAWABI HILL.

This is a low eminence, scarcely 35ft. high, on the west bank of the Akawabi Creek about five miles from the Koriabo River. It is of granitic formation with considerable masses of white quartz and with scarcely any laterite. It is covered with a fairly deep and fertile soil and is inhabited by a few Warraus. Half a mile further west are higher hills whereon the Warraus have their fields or provision grounds. This low hill was for many years the site of a Catholic Mission now abandoned, and I understand that the former missionary obtained many excellent specimens from the neighbourhood. Here there were numerous outcrops of shell accumulations while fragments of chipped quartz, broken stone implements and pieces of highly decorated pottery, as well as earthenware heads, were picked up in numbers on or near the surface of the earth. Excavations were carried on in this spot and revealed much of interest. (Fig. 7) The layer of shells was from three to six feet in depth and bore evidences of more ancient origin than those at Barambima Hill. In most places it was very barren of relics. Near the surface and in the loam above the shell deposits were many pieces of decorated pottery (Fig. 8) and among the

shells were a few fragments of plain pottery and several very crude stone implements consisting of spindles, celts, and chipped quartz arrow points. (Fig. 9)

Near the summit of the hill three skeletons were unearthed from the shell deposit. The first was of a man of enormous size (for an Indian) the thigh bone measuring 17 inches in length. Above the occiput and about 6 inches beneath the surface of the ground was placed an inverted conical dish or vessel of earthenware which was luckily secured whole and almost perfect. (Fig. 10) This evidently served in place of the rude earthen slabs found above the skulls on Barambima Hill and probably denoted a chief or man of prominence. What the purpose of these slabs or earthen covers may have been is largely guesswork, for I believe this method of burial has never been described or found previously and is an entirely new discovery. Very probably the covering served to protect feather crowns or ornaments buried with the bodies or it may have been placed over the head to prevent the earth from striking the occiput when filling in the grave or perchance, it was to protect the skull from injury from above and to support the earth and avoid the chances of the grave caving in after decomposition of the bodies. This skeleton like those at Barambima Hill, was in perfect condition and *in situ* when uncovered, but most of the smaller bones fell to bits, the larger bones cracked and broke of their own weight and the skull went to pieces as soon as removed. The jaws, much of the pelvis, the leg and arm bones and large pieces of the skull were, however, preserved intact. (Fig. 11) Close to this, and on either side were two other skeletons, apparently of women, and perhaps wives of the chief who had been sacrificed and interred with him. Neither of these had any covering of any sort over the head. All three skeletons were in a kneeling position with faces turned towards the east. No pottery of any description was found associated with these remains, but a few very crude stone implements were found. (Fig. 12) These may have been interred with the bodies or they may have been in the shell deposit when the bodies were buried, for the condition of the shells proved that the dead had been placed in graves dug in the shell mound.

The skeletons were apparently of the same type as those in the Barambima mound, although the teeth were normal and the molars and premolars large. All three possessed 32 teeth.

A very careful search of the entire hill failed to reveal any other human bones, but numerous bones of huge fishes, reptiles, mammals and some remains of unidentified and apparently extinct creatures were found associated with the shells and human bones.

The nearby hills were also carefully searched but no relics of any sort were obtained except on a low "red hill" where several earthen ware heads and fragments of decorated pottery were found.

OSSORORO HILL.

This is a high and large hill fronting on the Aruka River and connected by intermediate hills with the Wuanina Hills. It is the site of the Government rubber plantation and has been partly cleared. Its natural forest is fairly thick and heavy, and upon its crest there is a small pond or lake of water. It is of laterite formation, a distinctly "red" hill and no traces of shell heaps were found. Numerous fragments of pottery, earthenware heads and stone implements have been found here in the past and I secured a fair number. Below the hill and now largely covered by the swamp soil, is a large bed of sea-shells. These have been disturbed in digging drainage ditches, and it is impossible to say with certainty if they were placed in the spot by human beings or were accumulated through the action of the waves. They are far below the level of all other deposits noticed.

KUMAKA HILLS.

These are on the Aruka River about two miles below Ossororo and form an irregular chain with the Kobarima and Barambima Hills. They are mainly cleared and are occupied by the plantations of the Consolidated Rubber Co. Their forest growth is rather sparse and large areas are covered with a very thin layer of red soil. They are of laterite formation and distinctly "red hills." On these there are no shell deposits but for many years fragments of pottery, heads, images and stone implements have been found upon them in large numbers. All of these have been obtained from the eastern slopes and near the summit of the hill, where masses of laterite abound and where the soil is poorest. I obtained a very large collection (Figs. 13, 14, 15) of heads, many fine pieces of decorated pottery and a number of stone implements. Of these perhaps the most interesting are several flat heavy pieces of earthenware covered with what appear to be hieroglyphs or inscriptions and which I believe are pieces of inscribed tablets as they are plane surfaces and could not have formed any portion of a hollow vessel.* (Fig. 16.)

Another interesting specimen is a portion of an axe head formed by chipping while a similar fragment of the same size and form shows the appearance after being rubbed to a finish. (Fig. 17) As far as I am aware there is but one other specimen of a chipped axe known from British Guiana, a very perfect example found on the Potaro by Dr. Roth.

Most of the stone implements found on this hill were badly weathered and many had been broken, apparently through cultivation of the soil in recent years. Among the fragments of pottery is one which is decorated on the concave or inner side, which is very unusual.

No graves nor skeletons could be found on this hill but I was told by the manager, Mr. Pierre, that formerly skulls and other human remains

*A portion of the same, or a very similar "tablet" is preserved in the Georgetown Museum. Its locality is not given.

were found commonly upon or near the surface. As this hill was inhabited by Warraus in recent times and as these Indians succumbed in large numbers to an epidemic of measles, it is quite probable that these bones were those of the Warraus.

HANAIDA HILL.

Here a few fragments of pottery and heads as well as one or two stone implements were found on the surface. It contains no shell piles but is a laterite hill.

HOTAKWAIA HILL.

Granitic formation. One stone axe found. No shell heaps and no pottery.

HOBO HILL.

Granitic and quartz residual sands. Traces of comparatively recent occupation. In land evidently used by present-day Indians for provision grounds there were numerous sea shells, apparently remains of a destroyed shell mound. A few pieces of plain pottery and a stone axe.

SIMRI HILL.

Like the last. Evidently occupied by Indians for a long time and still in use by them.

HOTAHANA HILL.

On the Kaituma River. Shell mounds on one side. Fragments of plain pottery. No heads, decorated pottery or stone implements.

ANABISI HILLS.

Hills of lateritic formation distinctly "red." No shell heaps but fragments of decorated pottery, heads and stone implements.

MARUIWA HILL.

A "red" hill about six miles below Mt. Everard. No shell mounds but decorated pottery, heads and stone implements.

MTS. EVERARD AND TERMINUS.

Hills of granitic and lateritic formation about 60 miles from Morawhanna but not properly "red". The first and most prominent hills seen when ascending the Barima. No traces of shell mounds or any other relics.

KORIABO HILL.

About 25 miles south of Mt. Everard at the junction of the Barima and Koriabo rivers. A lateritic hill of decided red colour. No shells but numerous pieces of decorated pottery, heads and many finely finished stone implements. (Fig. 18)

MANIBARI HILLS.

Red lateritic hills on the Yarikita River. No relics of any kind were found on these hills and a careful search of the neighbouring hills, both in Venezuela and British Guiana, failed to reveal any signs of former Indian inhabitants.

From the foregoing it will be seen that in every case the shell mounds are found on hills of granitic, or partly granitic, formation and not on the "red" hills; that they are always on the lower portion of the hills and where the soil and other conditions are such that Indians might reasonably establish villages. On the other hand, with one exception—Akawabi—the decorated pottery, heads and well-made stone implements are found only on lateritic or "red" hills; usually near the summits or on the steepest slopes, scattered hit or miss over a large area and never in connection with the shell mounds except at Akawabi. It will also be noticed that no decorated pottery, no heads and no highly finished stone implements were found in the shell mounds or in the graves.

From these facts I am led to the conclusion that two distinct races inhabited this district in prehistoric times, one a primitive fish-eating tribe who dwelt upon the lower slopes of the island hills and perhaps cultivated the soil to a certain extent, but who had not developed the art of making ornamental pottery or well-made stone implements, but who used plain, crude pottery and wooden, and perhaps bone weapons to great extent. The other was a more highly developed race who were skilled in the manufacture of beautifully finished stone implements, who had developed pottery to an art and who probably inhabited the country and drove off or destroyed their more peaceful shell-eating fellows and occupied their lands and village sites. It is to this race that I attribute the skeletons, the decorated pottery and earthenware heads and most of the stone implements. Had the shell-eaters possessed such pottery and implements they would certainly be found among the shells, and it is highly improbable that the makers of the mounds would have buried their dead in the shell heaps where they lived. Moreover, the shell heaps had accumulated for many years before the graves were dug, for masses of semi-fossilized shells were found near the surface and fresh shells at the bottom of the graves, which would never have occurred if the bodies had been buried in shell heaps in use or in process of accumulation at the time of burial.

I am also convinced that the later and more advanced inhabitants were sun worshippers, or at least looked upon the sun with reverence, for not only were the bodies buried facing the east but the heads, pottery and other relics are invariably on the eastern sides of the hills. This fact, in connection with the fact that the "red" hills are not sites which Indians would find most satisfactory for permanent settlements, that the decorative relics are confined to such red hills and that they are in such numbers and so widely distributed convinces me that the original pots and images, the stone implements, etc., were not refuse or discarded utensils, from villages, but were placed upon the hills purposely. In other words, I believe that these Indians made offerings to the sun or to some deity upon these "red" hills and that the offerings were placed in vessels highly and elaborately decorated with symbolic patterns and devices.

"Red-hills are often selected by modern Indians for their provision grounds and it is not improbable that the offerings, if they were such, were placed upon the hills to induce good crops and freedom from pests, etc. Perhaps the stone implements were originally contained in the pots or placed with them as offerings; but it is more probable that these were dropped accidentally from time to time.

Only by such a theory can I explain to my own satisfaction the vast number of ornamental heads and vessels which are scattered over these red hills. If they were refuse from villages they certainly would be confined to the localities where the villages stood and would be found beneath the surface at considerable depths.

Moreover, it is difficult to believe that any Indian settlement would make and accidentally destroy so many ornamented pots, for such vessels entailed a great deal of work and no doubt plain utensils would serve for cooking purposes just as well; but no plain and undecorated pottery occurs with the ornamented relics.

There is but one objection to this theory, one fact which might render it untenable, and that is the presence of decorated pottery and heads upon the low granitic Akawabi Hill. The presence of these here may, however, be accounted for in either one of two ways.

The first explanation is that the decorated utensils were placed upon this hill because a chief or prominent man was buried here. The second, and most likely, is that it was here that the utensils were manufactured and that those found at the spot to-day were those broken or injured in the making. Several facts point to this. In the first place, all of the heads and pieces of decorated pottery found here were near a clay bed and were associated with bits of baked and half-baked clay and charcoal. Many were evidently imperfect in modelling, or distorted by baking, while last, and perhaps most conclusive of all, is the fact that among the stone implements found are several polished objects of jasper or quartzite which were unquestionably tools used in modelling and decorating the pottery (Fig. 9.)

But whatever the truth as to such matters, the question as to who these people were, remains unanswered. No present-day inhabitants of Guiana, or northern South America, make pottery of the type found on these island hills of the North West District. The Caribs, to be sure, make ornamented vessels, but the decorations are mainly in colour and the type of pottery is easily recognized and is totally distinct from these prehistoric fragments. Not only were these highly decorative in designs inscribed upon them, but they were brightly coloured as well, as shown by specimens obtained, while lips, bases, rims and handles were ornamented by well-modelled figures of birds, animals, reptiles and human beings. Many of these are easily identified, although usually conventionalized and often as grotesque as gargoyles, but Toucans, Macaws, Monkeys, Iguanas,

Frogs, Peccarys, Tapirs, Kinkajous, and in fact nearly all the birds and animals of the country may be found reproduced and it is practically impossible to find two alike.

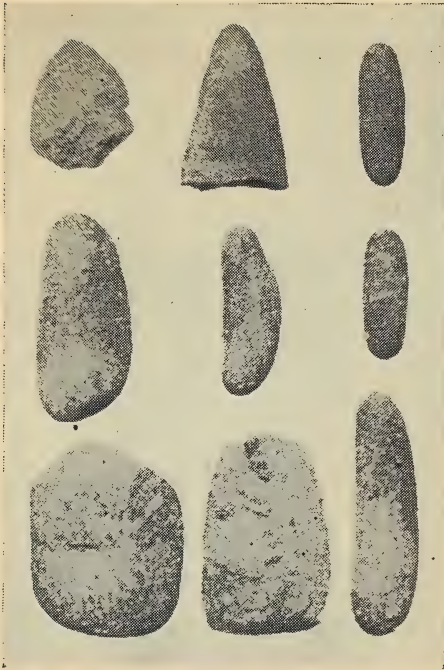
The inscribed decorations are often elaborate and consist of both scrolls and straight lines, arranged in geometric or other patterns, while in a few specimens, the patterns are in low relief.

In many ways they closely resemble the utensils found in the prehistoric graves of Central America, especially those of Costa Rica and Chiriqui, and the makers were certainly much further advanced in the potter's art than any of the existing aborigines of Guiana.

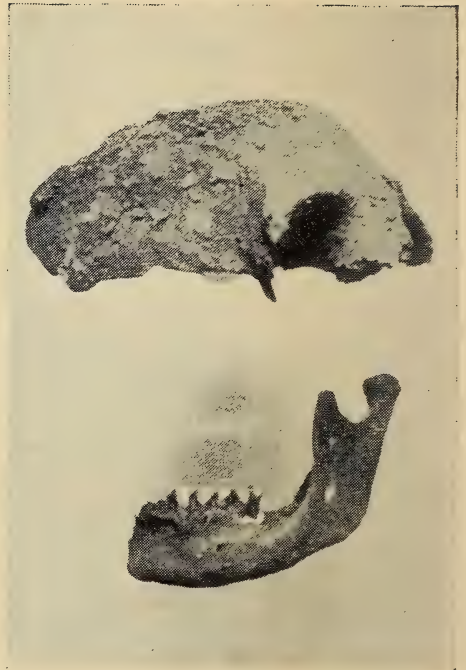


1. EXCAVATION OF SHELL MOUNDS.
BARAMBINI HILL.

2



3



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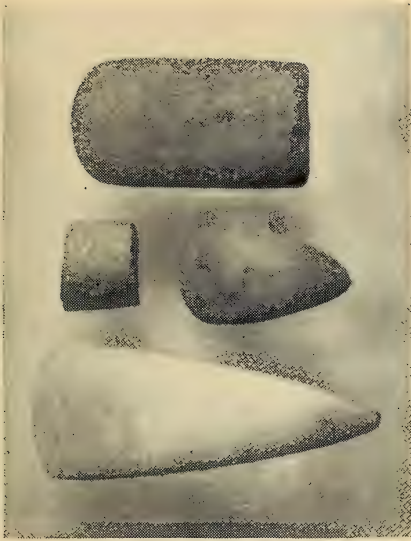


18



2. STONE IMPLEMENTS FROM BARAMBINI.
 3. SKULL FROM BARAMBINI.
 4. POTTERY AND IMPLEMENTS FROM KOBARIMA HILL.
 18. POTTERY FROM KORIABO HILL (BARIMA.)

5



6



7

5. STONE IMPLEMENTS, WAUNINA HILL.
6. POTTERY FROM DITTO.
7. EXCAVATING AKAWABI MOUND.

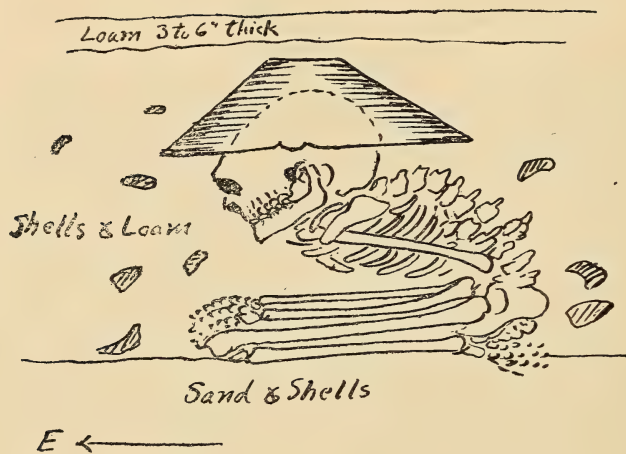


8. POTTERY FROM AKAWABI MOUND.
9. STONE IMPLEMENTS FROM DITTO.

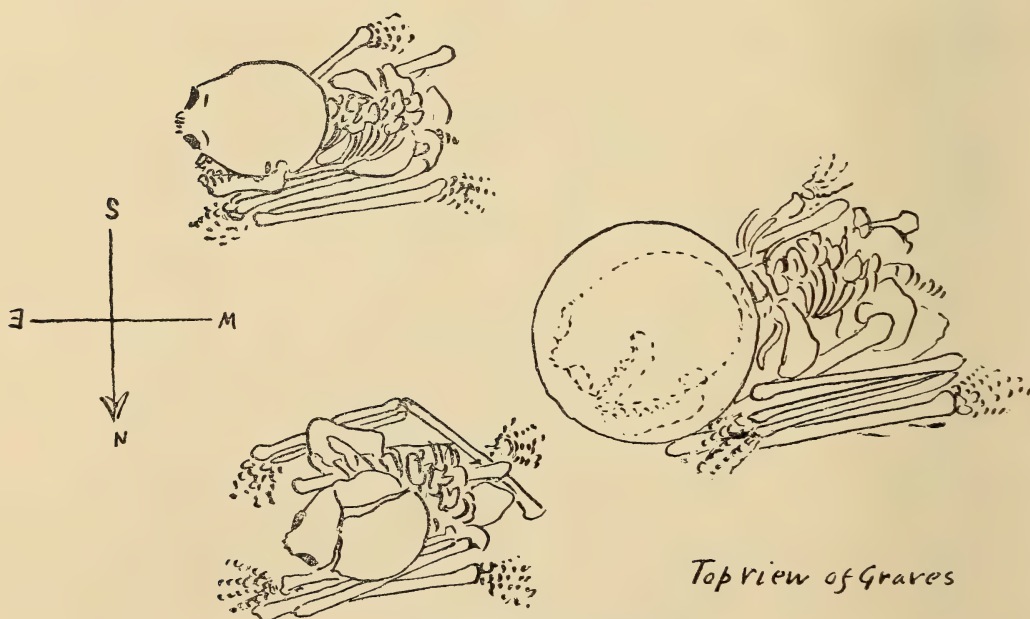


11

10. SKULL FROM AKAWABI HILL.
11. VESSEL COVERING THE SKULL.



Section of Grave



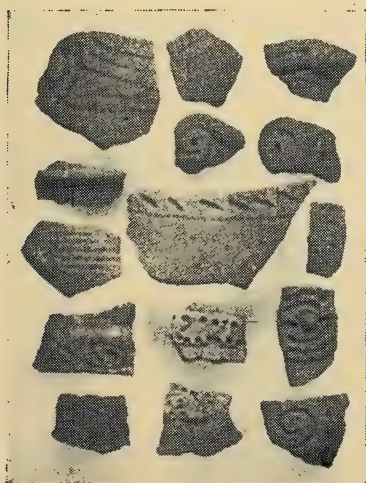
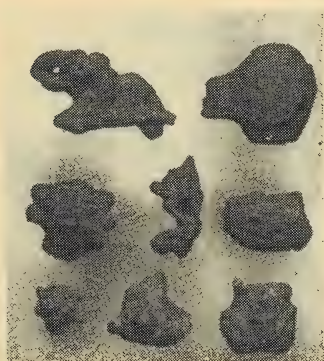
12. SKELETON IN SITU.



16



14

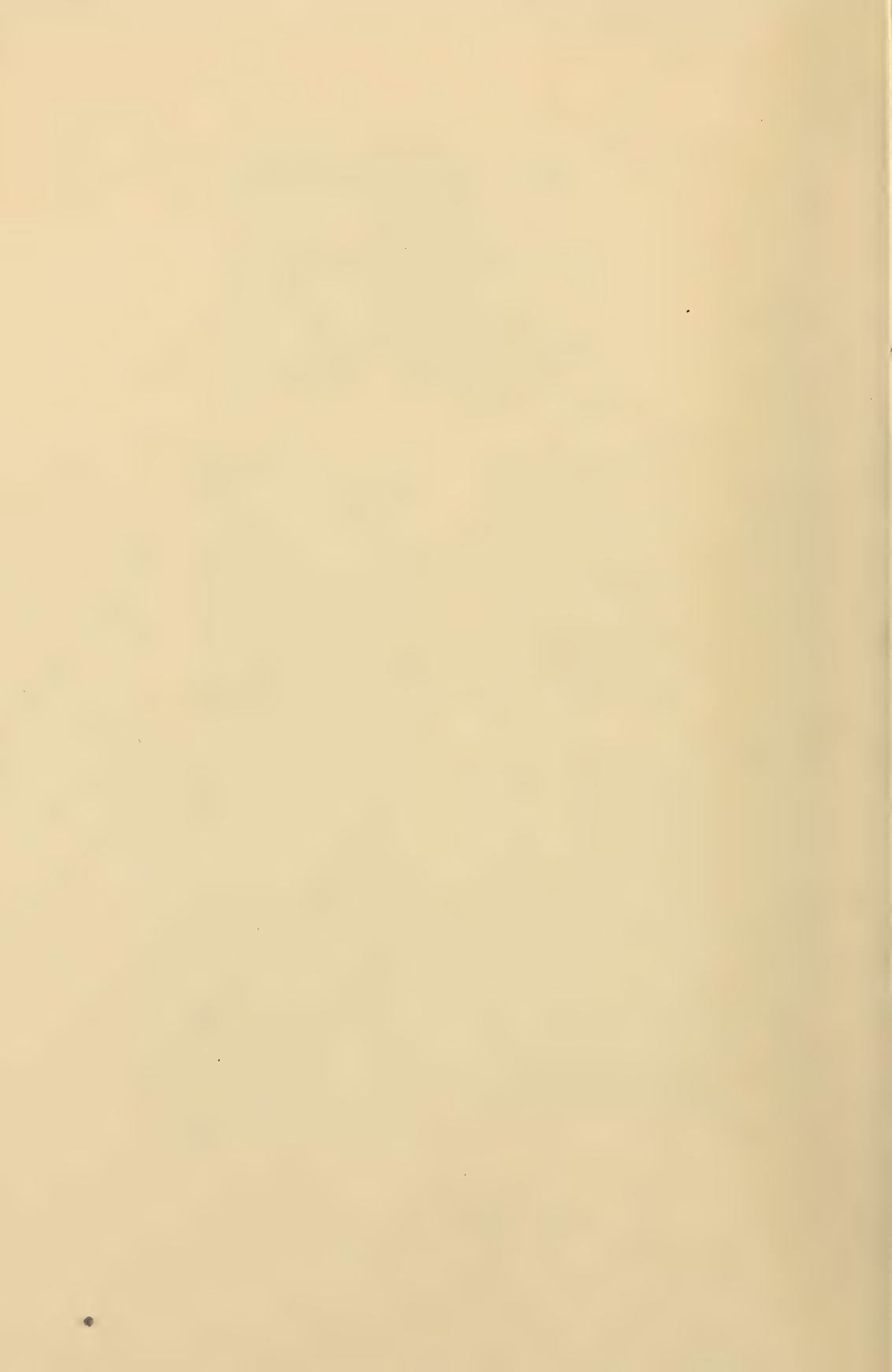


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15

13. POTTERY FROM KUMAKA (ARUKA) HILL.
 14 & 15. HEADS FROM DITTO.
 16. INSCRIBED TABLETS (?) FROM DITTO.
 17. STONE IMPLEMENTS FROM DITTO.



A REMARKABLE MOUND DISCOVERED IN BRITISH GUIANA.

A. HYATT VERRILL.

Although stone implements and fragments of pottery have been found throughout a large portion of British Guiana, and numerous extensive shell heaps or kitchen middens exist near the coast, yet hitherto, no proofs of large prehistoric settlements or of a numerous population have been discovered.

During the month of June, 1917, I discovered some most remarkable remains of Aboriginal inhabitants which appear to indicate a vast population where no Indians exist to-day and which, as I shall endeavour to explain, probably antedate all other known remains in north-eastern South America.

Indians are found to-day throughout a very large portion of British Guiana, and along nearly all the rivers, but a most curious fact is that certain rivers, such as the Abary and upper Corentyne, are absolutely barren of Aboriginal inhabitants. This is the more remarkable inasmuch as both rivers teem with fish, the soil along their banks is fertile, game is abundant and there is an ample supply of timber, wood, and other vegetation essential to Indian life. On the Courantyne the inscribed "Timehri" rocks point to former denizens, but on the extensive savannahs, which border the Abary, no monuments to a former population are visible.

None of the existing Indian tribes can give an explanation for this avoidance of the two streams, and I determined to make a thorough investigation of the Abary district and discover, if possible, any remains of former inhabitants.

Throughout the district the savannahs are dotted with so-called "islands,"—copses of palms and other trees standing boldly up from the level sea of grass, while, scattered about, mainly near the river, are smaller knoll-like "islands" usually overgrown with grass and coarse weeds and often with a few small trees or shrubs, or a palm or two.

In my investigations among the Caribs I had often found these islands inhabited by the Indians and I decided that if any traces of former inhabitants were to be found they would in all likelihood be upon these islands. But several of the wooded islands were investigated without result, their existence being due to a slightly higher and better soil than that of the surrounding savannahs and consisting of a layer of loam over a bed of clay resting on coarse, residual sand.

I then turned my attention to some fairly dry verdured land further up the river and which formed a sort of cape or peninsula extending for

several miles across the savannah and bordering upon the river. Here I was rewarded by uncovering numerous fragments of pottery and a careful search resulted in obtaining a number of stone implements, some polished and rounded quartz pebbles, and a perforated amethyst pebble evidently used as a pendant or bead.

But there was nothing to indicate a large population or anything more than the site of a former village, and no traces of graves or of defined kitchen middens could be found. However it proved conclusively that the Abary had been inhabited by Indians in the past and as the neighbouring Mahaica, Mahaicony and Berbice rivers are all inhabited by Arowaks, and have been since the first European settlers' times, and as the implements found were in no way distinct from those found elsewhere, I concluded the settlement was of Arowak origin,—possibly post-Columbian, and that it had been destroyed by the marauding Caribs or by the Bush Negroes of former days, never to be re-established.

Then my attention was attracted to one of the small knolls near the river and on which two or three plantain trees gave evidence of former inhabitants. This knoll was several hundred feet from the river and was surrounded on all sides by a deep swamp and almost impenetrable high grass. It rose about ten or twelve feet above the river (and savannah) level and formed a spur or promontory to a low ridge (about six feet in height) extending parallel with the river for about one thousand feet. Directly back from this first knoll was a second, and at three other points on the ridge smaller knolls occurred. Close to the first knoll the ridge was broken by swampy spots or sloughs, thus isolating the knoll and the smaller one behind it, the two forming a sort of dumb-bell shaped eminence.

After considerable difficulty the knoll was reached, and much to my joy I found a fragment of very old pottery resting on the surface of the ground. The bush was at once cleared and excavations commenced. The first shovelful of earth revealed numerous pieces of pottery and every care was used to avoid breaking the fragments.

It was absolutely impossible to excavate in the tenacious, wet, muddy soil without doing so; but it was soon evident that the vessels had already been hopelessly broken through an immense lapse of time. My first idea was, that I had found an old camp or village site, but in a very short time I was disillusioned and I realized that I had discovered something of far more interest and quite unique, for the earthenware was not discarded or broken pots, nor pots unintentionally left by their former owners, but instead, were utensils intentionally placed where found and evidently for some specific purpose. In each and every case a thin layer, about 6 inches, of loam, covered a heavy roughly fashioned piece of baked clay,—evidently the cover to a large vessel, and directly under this were the remains of an immense pot; collapsed and broken to be

sure, but easily traced, with the bottom resting on a bed of charcoal, black mud and lumps of burnt clay. This same material also surrounded each pot and there could be no question that the pots had been placed in the midst of a fire, the whole had been surrounded by a wall of earth and that in the process of burning the fire had baked the irregular lumps of clay in the earth to semi-brick. In many cases two, or even three, layers of these pots and fires were found, and in every case deeper excavations revealed the undisturbed bed of clay and sand of the savannah. The only explanation seemed to be that the pots were burial urns; that the bodies or bones of the dead had been placed within them and had been cremated by surrounding with fire enclosed in walls of earth, and that the knoll had at one time been the burial place of neighbouring Indians.

No traces of bones, stone implements or other utensils were found within the pots, but each was filled with a fine, pasty, black material which might well have been the remains of incinerated bones or flesh. That no stone utensils were found seemed remarkable but not even a pebble was discovered and I am forced to the conclusion that the people were either ignorant of the use of stone implements, or were a tribe devoted to fishing, and who had no use for weapons or utensils of stone.

But the most remarkable fact in regard to this mound was the area covered by these pots and the enormous number buried. The entire surface of the knoll itself was covered with them, each placed so close to its neighbours that the sides almost touched, and my wonder increased as we moved further and further from the knoll and still found the same identical conditions. For a space of nearly 600 feet along the ridge and for a width of about 150 feet every test showed the same inevitable pots with their attendant bits of charcoal and lumps of burnt clay. There were literally thousands of them (about 30,000 by my estimation), and if, as I believe, they were burial urns the number of the dead proves that an enormous population once dwelt on the Abary savannahs.

And I can think of no other explanation than this, for there are but three theories which can account for numerous pots found in a limited area.

First: An Indian camp or village of many inhabitants who were suddenly wiped out of existence leaving their pots behind.

Second: A prehistoric pottery with many imperfect and discarded pots and perfect pots suddenly abandoned.

Third: A burial place where the dead were interred in pots.

The first is untenable, as no Indian village could possess enough pots to cover an area of the extent examined. To do so the pots would have to be set regularly side by side over the entire area. Moreover the pots found were all of similar form, material, and size.

The second hypothesis is equally unworthy of consideration, as Indians do not possess potteries but each family makes its own pots as

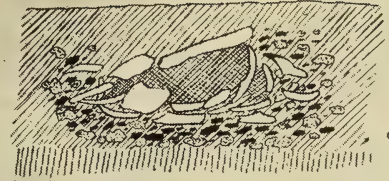
required. A pottery of sufficient size to have provided over 30,000 pots at one time would be a credit to a large city. Moreover potters do not bake each pot in a separate kiln.

The third theory is the only one which fits the facts. The covered pots, the covers being roughly formed by hand on one side and bearing the imprints of sand and earth on the other, as if formed of soft clay and covered with earth while fresh. The fact that all the pots were of large size; the surrounding charcoal and lumps of half-baked clay in the earth; their uniform position and the fact that they evidently had been exposed to fire and that they contained some material which had been incinerated, all tend to prove that they were the burial urns of some prehistoric unknown tribe which inhabited the savannahs in immense numbers, for it is unlikely that Indians would convey their dead to a common burial place from any considerable distance. The question then arises as to their age and their origin.

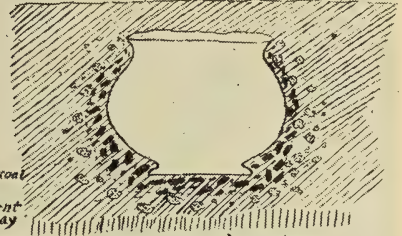
The thickness of the layer of loam over the pots can give little or no idea as to the time which has elapsed since the pots were placed on the knoll. It is entirely a vegetable mold formed from dead and decaying grass and weeds and for many years after the knoll was left to itself it was no doubt exposed to the heavy tropical rains which washed away the deposits almost as fast as formed. The growth upon the knoll is equally valueless as a guide for estimating the age of the pottery, for there are no large trees and the weeds and small growth are of a character which grows, dies down and grows again in a few years; the extent of growth depending largely upon the periods of drought and flood.

The condition of the pottery, however, proves that an immense period of time must have elapsed since the pots were placed upon the knoll. They have not been disturbed or broken by subsequent inhabitants for their original position can be traced, and yet, they have crumbled to bits and have collapsed through the lapse of countless years. I do not know how long it takes for a well-made piece of pottery to decay and disintegrate, and no doubt this varies with the climate and moisture of the soil, but it must require a very long period. Finally, as before mentioned, is the fact that no stone implements,—not even a smoothed pebble or chip of stone,—were found on the knoll. If this is owing to the fact that the inhabitants had no knowledge of stone-working if, indeed, they antedated the stone age, then the pots must be inconceivably ancient; but I am not aware that any race developed pottery-making until after they developed the art of making stone implements and I am of the opinion that the absence of such utensils points to a race which depended entirely upon fishing, tilling the soil, and perhaps snaring or shooting birds and small game, for which purposes bone or even hardened wood would serve every need.

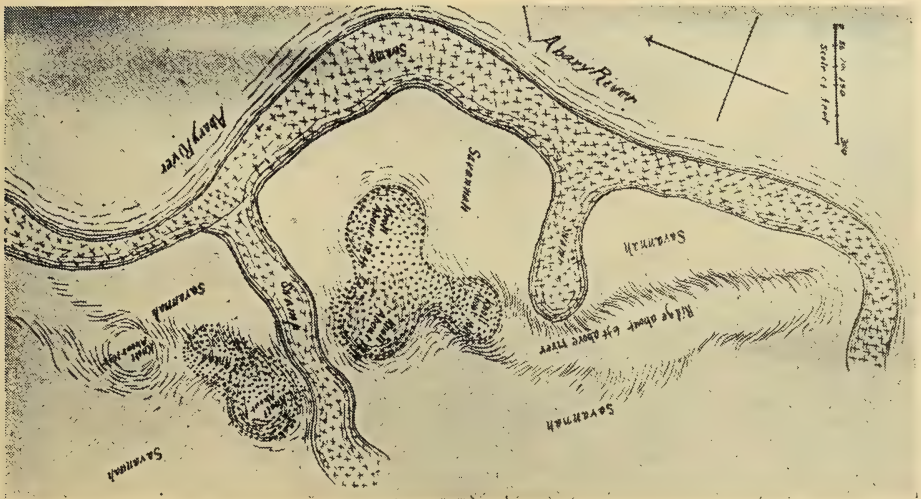
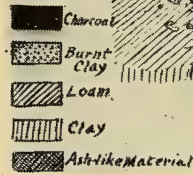
That they were a race antedating any of the present tribes of Guiana, I am convinced, and I am equally certain that they were totally distinct from



Section showing pot etc. as found.



Restoration of a bore



1. STONE IMPLEMENTS FROM ABARY.
4. SECTION OF POT ARRANGEMENT.
5. SKETCH OF MOUNDS.



2. THE MOUND ON THE SAVANNA, ABARY.



3. EXCAVATING THE ABARY MOUND.

any of the existing tribes. The fact that plantain and pine-apple plants were growing on the mound might be thought evidence that they were not very ancient, but this in reality has no bearing whatever as the cultivated plants might have been accidentally dropped there by travellers or by wandering negro fishermen or hunters. Moreover, many of these knolls are regular camping grounds for negro wood-cutters passing up and down the river and temporary sheds or benabs are often erected upon them. It might very well happen that such people should leave traces of their occupancy behind them and as the plantain trees were less than six months old and the pine-apples less than a year their presence proves nothing, except that they led me by merest chance to a very interesting discovery.

My conviction that these long-forgotten inhabitants antedated the existing tribes and were distinct from them is based on the following facts. No known British Guiana tribe buries its dead in urns, although burial urns have been found in various parts of the colony. But as far as I am aware, no traces have hitherto been found of urns exposed to fire for crematory purposes.

Moreover, none of the existing Indians dwell upon the swampy savannahs of the coast and the Warraus have no large settlements and have not developed pottery-making to any extent.

The other two coastal tribes, the Arowaks and Caribs, have no such burial customs as must have been possessed by the Abary savannah Indians. Wherever remains of ancient Carib occupancy occur we find shell heaps, stone utensils and remains of cannibal feasts, or at least fragments of human and animal bones associated with charcoal and broken as if to extract the marrow. In the portion of the colony now most thickly populated by Arowaks and Caribs no such mounds as described have been found, but shell heaps are common, and stone implements are universally found.

Certainly the mound could not have been the burial place for Akawoias, or any of the forest or highland dwellers, for these tribes have always been confined to the interior. I am therefore of the opinion that the pots are the sole remaining evidences of a once numerous prehistoric people who dwelt upon the savannahs near the coastland and who passed out of existence ages before the advent of Europeans. Unfortunately, I was unable to make investigations of all the similar knolls or mounds upon these savannahs, and there are hundreds, but I should not be at all surprised, if a large portion were the sites of ancient villages or the burial places of the inhabitants and I am confident that a systematic search of the mounds would result in most remarkable and interesting discoveries of remains of what were perhaps the earliest human inhabitants of Guiana.

A CHAT ABOUT THE SOCIETY'S PAST.*

BY J. RODWAY.

ITS NAME.

It has often been remarked that the name is not suitable, because the interests and objects of this Society are hardly agricultural or commercial. Possibly something like the Guiana Institute would have been better but it is too late to suggest a change even though the name is too long and not comprehensive enough.

The reasons for such a name are obvious to one who studies the social conditions of eighty years ago. There were then two cliques, planters and merchants, whose interests did not always coincide. There were even disputes which led to newspaper correspondence. At one time there was an attempt to get up a united society of merchants and planters which failed. In 1835 there was an Agricultural Society which invited the merchants to unite to establish a Public News Room and Exchange, but the planters would not join, and although it was started it went the way of many other societies which rose and fell from about 1810 until our Society came to stay.

Something can be said in favour of Agricultural and Commercial, for after all, our colony is based on agriculture and commerce. Every other interest is subservient to them, for even the officials could not exist without them. Our colony arms has a ship to represent Commerce and our motto means that we give and receive through our shipping agricultural products and getting desirable returns. It might be perhaps said that our forest products do not represent agriculture, but they certainly come under commerce.

The project for a comprehensive building or society was "floating in the air" as it were for some time. In November, 1843, it was proposed in the Town Council to apply for what is now the site of our buildings to have a Town Hall and a Chamber of Commerce; it was then stated that the Government were intending to erect thereon a Museum and anatomical rooms. "The Royal Gazette" suggested that the project should embrace, not only a Town Hall but a Public Library and Museum.

The paragraph in the "Royal Gazette" of February 15th, 1844, might be read to-day for it is still applicable: "The want of a due encouragement of public establishments, having for their end the advancement of art or science of any kind, has frequently been objected to by strangers, as a great omission in the social constitution." After referring to the proposed society it went on to say: "We cordially concur in the recommendation of this Society, less for the sake of the utilitarian purposes

* Read at General Meeting, July 9th, 1917

had in view—but which even have been too much overlooked of late in this colony—than because it promises to become the nucleus for the dissemination of a general public taste for intellectual and scientific pursuits, and more expanded social reunions, than have hitherto been in practice amongst us.”

ITS FOUNDER—W. H. CAMPBELL.

It has been often said that when the time comes for a change or improvement, the man arrives. “The hour and the man” had come, and I could say much about that man. I can perhaps appreciate him all the more because his tastes were similar to my own. He was a botanist and had been collecting plants in the Highlands and on the banks of the Scottish rivers. I have a MS. note-book in which he listed his collections and a copy of John’s “Botanical Rambles” with an account of a collecting trip by the author, and W. H. C. to the Highlands.

Mr. William Hunter Campbell, whose bust is so conspicuous in the Reading Room, was born in Edinburgh in 1814 and educated as a lawyer. Possibly as a recreation he took up Botany and we find him among the “few gentlemen” who met on the 17th of March, 1836, to start a Botanical Society for Edinburgh. Several Professors well known to the world were among the founders, and Mr. Campbell was appointed Secretary, although only 22 years old. His work for the Edinburgh Botanical Society was highly appreciated, and I have a copy of Decandolle’s *Prodromus* presented to him before he left for Demerara. In the Report of the Society it was stated that by his departure it had been deprived of the services of one who had contributed much to its prosperity and whose place it would be hard to fill. This was in 1841, and in 1843 a communication from him was read and an Eta razor strop from Demerara exhibited.

The first hint of our Society is contained in a letter of Mr. William Arrindell to Governor Light, dated January 19th, 1844, and as it is so important I must give it in full. I may here state that we have in our records the original “prospectus” in Mr. Campbell’s handwriting.

Demerara, 19th January, 1844.

SIR,—I have the honour to inclose for your perusal a prospectus and certain proposals for establishing a Society to be called the British Guiana Agricultural and Commercial Society. There appears to be a wish on the part of several of the leading merchants of Georgetown to have a united society, and hence the draft of the proposals in the form submitted—Should this union not be approved of the proposals can be readily altered and confined to a society purely agricultural.

These papers were drawn up by my young friend Mr. William Hunter Campbell—without aid or assistance from anyone—and I have great pleasure, founded on a sincere wish to further the interests of the Colony, in introducing the papers in question as the best evidence that can at present be offered of the fitness of Mr. Campbell to fill the situa-

tion of Secretary to the Society. In my wish to see him there placed I have no private interest to move—my sole object being that of having that office confided to one who I am sure will discharge its every duty with ability and efficiency.

Hoping that your Excellency will not consider my zeal outstripping the bounds of discretion and respect.—I have, etc.,

W. A.

To His Excellency, HENRY LIGHT, Esq.

This was promptly acknowledged on the 22nd. The Governor approved of the rules and the suggestion ; he had long been desirous of seeing a Museum, Library, Reading Room and Hall for public amusements, but he suggested some difficulties in carrying out all the objects by one Society. The letter is too long to be given here but it is decidedly interesting. He suggested an early meeting of both classes, *i.e.*, merchants and planters.

Copies were printed and distributed throughout the colony and we have a letter from Berbice giving the names of those to whom George Laing sent the Prospectus. We also have the originals that were sent out, dated February 1st, with the signatures of those willing to become members. All this preparatory work appears to have been done by Mr. Campbell and we may be quite sure that he must have been enthusiastic and assured of success.

The preliminary meeting was held on the 18th of March and this may be considered as the starting-point of the Society, for it was then arranged to form it and to provisionally adopt the Rules drafted by Mr. Campbell.

Mr. Campbell remained as Secretary until the year before his death in London November 3rd, 1883. We may, therefore say, that he was nearly forty years carrying on his "labour of love." Those who knew him well spoke highly of his kindness and sympathy ; as far as I know he had no real enemies, and when there was something like a persecution the colonists almost to a man rallied round him. The amount of work he did for the Society can hardly be estimated ; I happen to have seen the evidence when searching for the Society's records. Where he did not write the minutes himself he got his private clerks to help, for unfortunately the attendants in the Reading Room could hardly have been trusted with anything beyond routine work. When Mr. Luke Hill was chosen as Secretary he was not prepared to spend so many hours on the Society's work. This could hardly be expected, but it shows what Mr. Campbell willingly did because it could not have been done otherwise. The present generation has to thank him, and every member to-day should think of this when his bust comes in sight at our entrance.

When I call him the founder of the Society I do not mean to disparage the other members, but to show that our Society, like many others, was very largely due to one working member.

ITS PATRONESS—QUEEN VICTORIA.

Queen Victoria became Patroness in the first year of the Society and as her connection was so important we must place her name after that of the founder. From the autograph volumes exhibited it will be seen that Her Majesty did not forget the Society when making donations, or object to the use of the word "Royal."

The petition for the Queen to become Patron was first mentioned at a meeting of the General Committee (Directors) on the 1st of May, 1844, and a letter from the Government Secretary in reply was dated July 15th; Lord Stanley said that Her Majesty's Patronage was contingent on the affirmation of the principle that no political questions shall be discussed at their meetings.

When this was read it was resolved that it be now distinctly affirmed that the Society never intended to sanction or permit the discussion of political questions at any of their meetings.

The Society having got the Queen as patroness asked to be allowed to use the word "Royal." The copy of the letter from Lord Stanley was received through the Government Secretary on the 3rd of March, 1845 :—

"Her Majesty has been graciously pleased to allow the Agricultural and Commercial Society of British Guiana to assume the title of 'Royal' in addition to its other designations."

Queen Victoria presented four portraits which were fortunately saved from the fire and which are shown in the Reading Room. They were prepared at the time of the marriage of the Princess Royal to Frederick of Prussia. I remember well the picture papers of that time and also when a year or so later children sang a ditty with something about jumping for joy—"For Victoria's lovely daughter's got a pretty Prussian boy." This "pretty Prussian boy" was the present Kaiser. I also show the Prince Consort books with the Queen's autograph.

Since the death of Queen Victoria, King Edward, and now King George have been Patrons.

I noticed that there was a Royal Agricultural Society in Jamaica when our Society was started but as far as I know ours is now the only "Royal" Society in this part of the world.

ITS VICE-PATRONS, &C.

Starting with Governor Light we have had every Governor on his arrival in the colony; no one has ever refused his consent. Some have made considerable donations of money and books, among whom I may mention more particularly Governors Light and Hincks.

The Government Secretaries have always been prominent members and some have filled the office of President. I can only here mention the names of Mr. H. E. Fox Young and that other prominent member William Walker, who was so long our London Director and to whom we are much indebted. He helped the Society in that crucial period between 1850 and 1860, when the colony was so much depressed. The foundations of our Library are due to his selection of really good books after his retirement; he was also of great assistance in getting donations for the present building after the fire. Although he was not in the colony when the Society was formed he may be considered as one of the most important members.

Other Government Secretaries, including W. A. G. Young, Sir Charles Bruce and Sir Cavendish Boyle, can only be mentioned. I purposely exclude those who are still with us.

THE INTRODUCER—MR. (AFTERWARDS SIR) WILLIAM ARRINDELL.

This gentleman was at one time probably the most abused person in the colony. He defended the Rev. John Smith after the East Coast Slave Insurrection and thus annoyed the people who were carried away by their feelings and wanted a scapegoat. Mr. Arrindell lived to become Chief Justice and to be Knighted for the code of laws he prepared after the Emancipation. We may consider him as a man without prejudice, and one who took what he believed to be the right course.

It will be seen from the letter already quoted that Mr. Campbell was his "young friend" and we may safely state that Mr. Arrindell was Mr. Campbell's patron as well as his chief. Mr. Campbell was Clerk of the Court and I understand was not simply patronised by the then Attorney General. Possibly when the great Beaumont disturbance took place he missed his old friend.

Mr. William Arrindell was a member of the first Council and was interested in agriculture as an estate proprietor. Although he suffered much odium in defence of the slaves the agitators of the forties abused him as a planter and objected to his being appointed Attorney General first and then Chief Justice. In their opinion no planter could be impartial where the freedmen were concerned.

THE PRESIDENTS.

It cannot be supposed that I can even give a list, much less say anything more about the fifty Presidents who have occupied the chair from year to year. The Chairman of the first meeting was Sir Michael McTurk, one of the most important personages in the colony at the time. As an officer of the Militia, planter, a director of local institutions and a member of the Court of Policy, he was more prominent than as a physician. He was Knighted for the part he took in proposing the curtailment of the "Apprenticeship" so as to end all coercion of labour in 1838.

We have no portrait of Sir M. McTurk, but our second President, John Croal, is represented by the oil painting so conspicuous in the Reading Room. He also was an important personage and connected with the British Guiana Bank. One of the most prominent was Mr. William Russell, who helped Georgetown to get a continuous supply of Lamaha water. He was elected President at intervals so that he served several terms and gave prizes for essays on agricultural subjects.

THE FIRST MEETING ROOM.

The usual place of meeting in the forties was a room in the Demerara Spa, where the Hotel Tower now stands. An ambitious project was made to have a Spa on the lines so well-known in England. The artesian wells, which were once expected to be an unfailing source of a water supply were found to give a chalybeate salt water something like some that were puffed up in England and Germany. People were invited to come and drink the water, and baths were also provided; then there was a reading room. But it was a failure for it never became a fashionable resort. The well still pours out some water and the visitors to the hotel may try it as a medicine. It is possibly as useful as many other mineral waters, and probably not more nasty.

THE SITE—OLD HOSPITAL LOT.

The Public or rather Seamen's Hospital once stood on or near the site of the Commissary's Office and possibly that building may contain portions of the original framework. However that may be we have a relic in what was once the lock-up for maniacs east of the Museum. The Cumingsburg Hospital was finished about 1840 and the old buildings became vacant. We have already seen that the lot was wanted for a Town Hall, but the Government refused to grant it to the Town Council. I show a plan, from which it may be seen that the lot extended from Water Street to High Street and that there was no road cutting through it. The Assembly Rooms, are at the extreme east; they got half the lot by consent of the Society.

From the series of plans exhibited it may be seen that the lot was originally just inside the mud dam that became Water Street and which was only 24 feet wide. Charles Edmonstone's timber store was outside the dam, and probably raised above the mud on which timber was stored. There is a bend or projection into the river which allows Water Street to come a little more to the west at this spot, perhaps due to Fort St. George having once been situated here. There was a dispute with the Town Council in regard to the Water Street front, in connection with which these interesting plans were prepared.

The Society got the grant during Her Majesty's pleasure, and preparation was at once made to remodel the old buildings so that they might be fitted for a reading room and place of meeting. There appears to have been two old buildings, much dilapidated, one fronting Water

Street, and the other High Street, but from the situation of the artesian well near the first building we must say that Water Street was then under the east of our Reading Room, for the artesian well though now closed, is still to be found under the east half of the Museum. This goes to prove that Edmonstone's timber flat was where the street was laid down after the fire, and that his office would be on the present Reading Room site. This should make it all the more interesting, although it is no new discovery that the great fire not only made a clearance, but allowed the bank of the river to be pushed farther out.

The drawing of the old Reading Room exhibited, gives a fair idea of its appearance. The other building is now the Commissaries Office; it has been occupied as magistrates, immigration and post offices, as well as by The Georgetown Athenæum, and as an Armoury. Half the original grant was given to the Assembly Rooms by consent of the Society, and the east building with another piece of land was sold to the Government after it had been repaired at the Society's expense.

It is interesting to note that when Edmonstone's store was where we are now standing, Charles Waterton must have often paid a visit to "the greatest friend he ever had in his life." Here also he must have first shown his "Nondescript" as the Wild Man of the Woods.

THE PRESENT BUILDINGS.

The old Reading Room was entirely destroyed in 1864. The bust of Dr. Blair is said to have been pushed out of a window, and having fallen on mud was not much injured. The Queen's portraits were saved, but nothing else save a few odd books then in circulation. It was generally supposed that the minute books had also been lost but fortunately I found them in 1888 by enquiry of Mr. Forshaw, who allowed me to go over Mr. Campbell's papers.

The fire was a blessing in disguise, for it gave the Society a new lease of life. For some years it was hardly progressive although by no means inactive. A little spirit had been given by an offshoot in the form of a Natural History Society which was to have a Museum. This Museum was actually commenced about 1860, but without proper accommodation or attention the few specimens went to ruin. The store-room where they were kept was not burnt down, but the upset of the fire put an end to the Natural History Society.

The Society was allowed the use of the Assembly Rooms after the fire, but as there was no longer a library, some of the members dropped out through not paying subscriptions. There was much work to be done, but Mr. Campbell was able to do it.

HELPERS AND HINDERERS.

In every Society there are always a few more prominent than the others. Some are fault-finders, but unless they also work to improve

things by getting rid of the faults they are only meddlers. There have been many fault-finders within my own experience of the Society. First come those who say that the Society does nothing to improve agriculture or commerce, and therefore we should change its name to something like the Georgetown Circulating Library. Then come people who say that it is a "Mutual Admiration Society" and others who want it to grind some particular axe. These are of no real value in any Society.

Only once can I find that a member was expelled. This was John Emery, editor of a scurrilous newspaper, who charged the Society with being a "hotbed of politics." In self-defence the Society was bound to take notice of such a charge.

The most absurd fault-finder is one who continually abuses everything but when called upon to serve on a Committee does nothing. Sometimes he abuses the actions of others if he is outvoted.

Fortunately for the Society it has had quite a fair number of real workers; sometimes there are three generations. A good example is the Conyers family. Charles was an original member, Francis Albouy helped in building the present Reading Room and was Treasurer for many years, and we have Frank as a member to-day. Such cases however are not numerous for many of the best workers have left the colony with their families. I cannot mention even the names of those who helped but I must not forget Mr. G. H. Hawtayne who started the Popular Science Lectures and Mr. Darnell Davis who helped by his presence on the Book Committee. Before Mr. F. A. Conyers was Treasurer R. W. Imlach *alias* "Old Blazes" held that post for many years. He was certainly a "character," honest but too fond of the big D. Those who knew him smiled but he certainly gave offence to strangers. Mr. Luke M. Hill was a good Secretary, and did much to improve the buildings.

It must be understood that the present officers and members are not mentioned because their work is better known.

UPS AND DOWNS.

In the seventy-three years of its existence the Society has necessarily had its times of depression which generally corresponded with those of the colony. When it started there was a gleam of hope. Six years of freedom had upset the old conditions, ruin came to many of the planters, but, like some other upsets emancipation was not an unmixed evil. A new start was made and the Society came into existence when people began to hope for better times. There were, of course, many ideas floating about as it were and some absurd projects brought forward. The Society let everyone have his say and even made experiments in tile drainage and ploughing. Some of these failures were useful to prevent future mistakes.

The enthusiasm of the first few years did not last, for the depression of the colony which came through the gradual loss of protection to Colonial sugar, was felt by every one. The Society, however, slowly but steadily progressed, building up a fairly good library and discussing everything bearing on the welfare of the colony. Mr. Campbell's original by-laws were somewhat modified but there was no radical change. We may say that the Society was due to an upset when a spurt was made, but this leap was followed by a jog-trot. Progress was visible but slow.

In 1864 came the Great Fires to which Georgetown largely owes its practical immunity from yellow fever. From one standpoint it was a great disaster, from another it gave room for improvement. The effect on Georgetown influenced every institution and necessarily the Society. Pessimists would have said, "Let the Society go for it has already gone," but Mr. Campbell never said this. Arrangements were made for continuing and for building something better.

I cannot find that there was any Insurance money to receive and therefore nothing available for the new start. The fire took place on the 3rd of April. A meeting of the Directors was held on the 14th to consider what should be done. Mr. A. W. Perot was then President, and it was resolved to take immediate steps to raise a fund and erect without delay a new building which would provide room for a Museum. The loss was estimated at \$25,000. The responses to the appeal for donations were so prompt that on the 22nd they amounted to \$4,255. I cannot go into the particulars of how subscriptions were raised in the colony and in England, but the work was done, with the result we can see to-day. At first it was intended to have a Museum on the lower floor, but this gave place to the Post Office and Pilot Office which necessitated a special Museum Building. And here I may call attention to the fact that the tower and lower floor were built for the signal station and Post Office, and I have always held that there is a moral obligation on the part of the Government to occupy and pay rents for the portions so provided by their request. It will be seen that the first building accommodated the signal office and therefore it was continuous down to a few years ago.

The result of the fire was an impetus to the Society which has continued with slight fluctuations to the present. My personal experience begins with 1870 when the new buildings were completed with a new library already of some value. I was agreeably surprised to find many of the books I specially desired to give me an insight into the colony and its resources; the local literature was greedily devoured and I must have pestered the Managing Directors for special permission to borrow many books. As an Associate, however, I did not attend the meetings because I might have been an intruder, but I read the reports and always took an interest in the work of the Society. The subscriptions were then \$16, \$12 and \$8. Ladies had not yet been admitted and were very few until recent years. It was suggested to me that I should become a member so as to be free of the meetings but \$16 repelled myself and many others who might have been useful.

The Society was much improved, and when Mr. W. Russell was President he offered valuable money prizes for essays, which were published; later came "Timehri" which has undoubtedly brought the Society before the world.

But another impetus was required and this came without a catastrophe. In 1886 the colony was much depressed and it was felt that the Society's subscriptions were too high. Led by Mr. Mewburn Garnett, who belonged to a family of which several members had long been connected with the Society, a motion was brought forward to reduce subscriptions. When this was introduced Mr. W. Russell, then President, said he had never before seen so many at a general meeting. The Directors were not altogether pleased at the remarks made which they considered as reflections on their management, and therefore when the resolution for reducing subscriptions was passed, the President and one of the Directors resigned.

At first it seemed as if the income under the new rules would decrease but when a few years afterwards the number of members became greater than ever before (or since) the move was justified. A series of popular lectures was started and many improvements made, so we may safely state that this was another step forward.

Unfortunately, however, there came a great drawback through the removal of the Post Office and the Pilot establishment which resulted in a considerable reduction of the rents. This hampered progress and stopped "Timehri." To add to the financial difficulties the grant to the Museum was reduced to less than half. However the Society has survived in spite of the croakers who suggested that the Museum should be handed over to the Government.

THE SOCIETY'S WORK.

Some will ask whether the position to-day justifies the Society's existence? What has it done?

The first answer I can give from my own experience. When a person goes into a new place he wants to find a library with books that will tell him about the country. This has been provided by the Society through a period of about sixty years when there was no public library, and when hardly anyone had a private one. The necessity for a supervised collection of books is obvious; unfortunately for the book lover his volumes cannot be left alone without risk even for a few months. The result is that few people attempt to keep books, and therefore the lending from one to another so common in England is unknown here. The Society has provided a library with a unique collection of local works, so desirable to every new-comer and even to many old colonists.

The second great work of the Society is the Museum. It is true that it is now supported by the Government grant, but much has been spent in the past from the Society's funds. I will not say more, for it is open to the inspection of the public,

Since 1851, the Society has conducted local exhibitions as well as the necessary preparations for those abroad where the colony was represented. Those only who know the amount of work connected with them can appreciate the value of the Society. For his services at the London Exhibition of 1862 W. H. Holmes was knighted and for similar work of the Colonial and Indian Exhibition Mr. G. H. Hawtayne received a C.M.G.; both were prominent members of the Society.

The file of "Timehri" laid upon the table shows another aspect of our work and it may be stated that the curators of the Museum have helped to make the colony known to the world. Much has been said about advertising the colony, but this cannot be done by official publications; books like Brown's "Canoe and Camp Life" and Im Thurn's "Among the Indians" are bought to be read and kept where a Blue-book is neglected. Mr. Barrington Brown was a member, and Sir E. F. Im Thurn, curator of our Museum, when their books were written.

One of the objects of the Society was to offer Premiums for improvements, and it is not generally known that this was done in 1846, by the Government at the request of the Society. The list is exhibited but I have not found out whether Premiums were actually awarded; the amounts offered were from £1 to £30.

In looking over the progressive development of the Society we can say that the whole colony has been better and wiser because it existed and therefore we must give all praise to Mr. Campbell and others who did the pioneer work. Every member who feels the value of our institution must say that, in spite of fault-finders, it has justified its existence.

I may mention that several of the more important institutions of the colony were due to the memorials of the Society. The first Agricultural Chemist, Dr. Shier, had his laboratory on our premises and later the Government established the Botanic Gardens and Department of Agriculture at our request. The Chamber of Commerce is the outcome of our Commercial Committee. In one way or another the Society has helped local industries, gold and rice may be mentioned as well as balata. It has always been prominent in exploration; Sir Robert Schomburgk was honorary member in the first year, Mr. Barrington Brown came in later. Im Thurn and Quelch were explorers; they paved the way for those who came later.

In conclusion I must state that this only skims the surface; the history of the Society would fill a book. Some of the materials for such a work are exhibited but these are by no means all. It may be safely stated that every man of any note in the colony has been a member, and that the few who remain outside are at a disadvantage. Barbice once had a Reading Society on similar lines, but I understand it has now degenerated and its library is of little value. Our Society has seen the rise and fall of many others,—there is a proverb, "nothing keeps long in Demerara," but every rule has its exceptions.

CONVERSAZIONE,

MAY 24, 1917.

ADDRESSES TO THE GOVERNOR.

HIS EXCELLENCY ON HIS "STUDIOUS YEAR."

In the evening a conversazione was held in the Reading Room of the R. A. & C. Society, His Excellency Sir Wilfred Collet, K.C.M.G., being present with Capt. Parker, A.D.C., in attendance. There was a large gathering and a pleasant evening was spent.

A musical programme was gone through, the opening item being a pianoforte solo by Mr. H. N. C. Edwards who played 'Caprice' by Harold Martin-Sperry. Mrs. Clavier followed with the song "Love's Garden of Roses" while Lieut. Hoban's contribution was "She is far from the Land." A charming song was next rendered by Dr. F. G. Rose.

Following this was an address by Mr. A. Hyatt Verrill on "Some things seen in the colony" with lantern illustrations. (*See page 1*) Mr. Verrill treated the audience to a brief description of his latest journey into the interior and of the several places of interest visited.

His Excellency proposed a hearty vote of thanks to Mr. Verrill for his interesting and instructive address and the vote was carried by acclamation.

ADDRESSES TO THE GOVERNOR.

Next came the presentation of addresses of welcome to His Excellency, the first being read by Dr. Nunan on behalf of the R. A. & C. Society.

The text of this address was as follows:—

Address by the Royal Agricultural and Commercial Society to His Excellency Sir Wilfred Collet, K.C.M.G.

Your Excellency—

The members, associates and subscribers of the Royal Agricultural and Commercial Society take the opportunity this evening of welcoming you to British South America, and of thanking you for accepting the office of vice-patron.

In your heavy task of Administration, Your Excellency will always have the support of the Society, a non-political body, the parent of many of the colony's most useful institutions, as full of active life to-day as in the past. It comprises the planters, merchants and officials of the colony, representing every race and creed of our population. It has a history of seventy-three years and is the only Royal Society in the West Indian dominions. Its watchword is Progressive Continuity.

You will already have learned that there is no division of opinion among our people as to the Colony's requirements, whatever difficulties we may frankly realise as existing in the way of their fulfilment. These requirements may be summarized in the words population (including colonization and sanitary progress) railway development, harbour improvement, irrigation, equipment for sugar manufacture, exploitation of forest products, mines and stock. Its forward strides, checked for a time by the great war, the colony while devoted heart and soul to the earnest prosecution of the war, will welcome any measures which your Government will frame to meet the situation at its close. The Society will be of assistance to your Excellency in the accumulation of all necessary data and in the creation of an informed public opinion on any non-political issue. We are at present engaged in considering on the one hand what further assistance we can render to the Empire in the current year, and on the other hand in preparing for a great Agricultural and Horticultural Exhibition for 1918.

In its various activities we look to you confidently for advice, assistance and a guiding hand. We trust we shall often have an opportunity of welcoming you in our midst and we desire to express our heartiest good wishes for the success of your administration, a success meaning so much for this great undeveloped Continental asset of the Crown, our only possession on the South American Continent, which presents a splendid field for capital and enterprise if honestly and intelligently expended. The Society is convinced that as the colony has had a lingering dawn it will all the more certainly have a brilliant day.

We congratulate you on having by industry and ability reached, while still in the fulness of intellectual and physical vigour, the highest rank in the Colonial Civil Service. We believe that your ripe experience will enable you to crown that record here.

We assure Your Excellency of our loyalty as a Society, for His Majesty Our Gracious Patron has no more devoted subjects than the people of this colony, which treasures recollections of his early visit.

CHAMBER OF COMMERCE ADDRESS.

Mr. A. P. G. Austin, on behalf of the Georgetown Chamber of Commerce, read the following address :

Georgetown, Demerara,
24th May, 1917.

To His Excellency,

Sir Wilfred Collet, K.C.M.G.,

We, the members of the Chamber of Commerce of the City of Georgetown, desire to extend to your Excellency a hearty welcome to the colony on assuming the high office of Governor.

Under the dark shadow of the great and terrible war this colony has assumed a measure of prosperity unknown to it for many years.

This is a fortuitous circumstance beyond all control or expectation, but we look forward to a continuance of this prosperity when happier times return, and if a system of Imperial Preference be adopted after the war.

We are confident that Your Excellency will spare no pains to encourage and develop by prudent and well-considered measures not only the important industries which already exist, but the other resources of the colony which are believed to be great.

We respectfully beg to assure Your Excellency of our staunch and ready help at all times and that Your Excellency may invoke our assistance for the consideration of commercial matters and the advancement of the community generally.

A. P. G. Austin, President; G. R. Garnett, Vice-President; P. Cressall, jnr., do.; Jules Pairaudeau, secretary; C. Farrar, treasurer; T. T. Smellie, C. F. Wieting, Jorge Comacho, J. E. Strickland, C. E. Vezey, M. Gomes, W. B. Gray, A. P. Sherlock, J. B. Laing, A. K. F. Duncan, Council, on behalf of members of the Chamber.

THE PLANTERS' ASSOCIATION.

The address of the Planters' Association, read by Mr. H. E. Murray, was as follows :—

Your Excellency,

The members of the Planters' Association desire to welcome you to British Guiana and to assure you of their whole-hearted co-operation and support in any question on which you may wish to have their assistance or advice.

On your assumption of the reins of Government of this Magnificent Province we desire to emphasise our opinion of the supreme importance of the introduction of population. We believe that the colony should become to India what Canada is to Great Britain—a field for surplus population and if Your Excellency is successful in introducing suitable measures to attain this object, you will be doing something for which not only the present generation but generations to come will be truly thankful.

We give you a hearty welcome and assure you of our best wished that your administration will be a happy and successful one.

VILLAGE CHAIRMEN'S CONFERENCE.

Mr. J. MacFarlane Corry read the address from the Village Chairmen's Conference, the text being as follows :—

May it please Your Excellency—

On behalf of the Village Chairmen's Conference, we the Executive Committee beg to be permitted to represent the villagers

throughout the colony for the purpose of according to Your Excellency a cordial and sincere welcome as the Representative of His Gracious Majesty our King.

As villages we came into being during the reign of His Majesty's illustrious grandmother, Victoria the Good, whose memory we are now celebrating; and during that same reign we so developed as to obtain a large measure of self-government under the guidance of the Local Government Board, for which we are grateful.

The Village Chairmen's Conference is the outcome of the desire on the part of the villages for an intelligent co-operation with the Board.

Your Excellency will no doubt be pleased to learn that a large number of "Our Boys" at the front to-day, went from these villages, and that whatever the needs of the Empire may require in every particular the Government may rely on our support and assistance.

We look forward to the time when under Your Excellency's beneficent rule, the outstanding difficulties of drainage and sea defence will be removed, and these villages take their proper place, as the backbone of agricultural development in the colony.

We wish for Your Excellency health, strength and a prosperous career as Governor of a colony the inhabitants of which take no second place in their loyalty and devotion to the Throne.

We are Your Excellency's humble and loyal servants.

(Sgd.) J. MCFARLANE CORRY,
President.

B. S. PIERCY,
Vice-Pres.

E. D. MILLINGTON,
Secretary.

W. H. HINDS,
Asst. Secty.

JOSHUA THOMPSON.

HIS EXCELLENCY'S REPLY.

In returning thanks to the several bodies His Excellency said that a Governor's first year in a colony, especially in one like his, was always his studious year. It was the year in which he should gain a detailed knowledge of every part of the colony so that he could form a definite opinion of his own. He had begun to make observations, and had already seen the necessity for increasing the depth of water over the bar at the mouth of the river. Before forming any definite opinion on any particular point he would study everything carefully and hoped that when he moved in any direction he would have the support of the majority of people in the colony.

On the invitation of Dr. Nunan some of those present visited the Museum which was brilliantly lighted.

The gathering afterwards dispersed.

INSECT HOMES.

BY L. D. CLEARE, Jnr., F.E.S.

The habit of building homes either for the protection of their young or as shelters for themselves, so often found among the higher animals, is quite as pronounced in the insect world and serves the same ends as in the higher forms.

Homes, as we understand them, to accommodate both parents and offspring, are not often found in the insect world. Insect 'homes' may be divided into several classes, both according to the type of dwelling and stage of development.

Some of these homes are mere hiding places for a stage of the insects formed by themselves, such as the 'nests' of some Lepidopterous larvae, —made by drawing together a few leaves. The far more common type however, is made by the parents for the protection of their young or by the larvae for the protection of their helpless pupae. With these homes the parents usually have no further connection after provisioning them with food for the young. An exception, however, can be found in the fossorial wasps of the Family *Bembecidae*, locally known as 'cowfly tigers,' for here the parent supplies the larva with fresh flies until it pupates.

The nearest type to a home as we understand it is probably found among the leaf-cutting or 'coushi' ants (*Atta cephalotes* L. et spp.) though, in this case, it will probably be compared to a city on account of its large size. Here a number of individuals of different types are accommodated but they are all of the same parents. This is probably the highest development of the 'home' amongst insects.

The material used in the construction of the homes is usually either vegetable, parts or the products of plants, or substances such as earth, clay and stones, and while these are often worked up by the insects they are sometimes used in their natural state. In special cases, however, the material may be made entirely of some secretion of the insects themselves such as the wax cells of bees and the silken cocoons of a number of insects.

This habit of home-building appears in a large number of the Orders of insects, but probably reaches its greatest development among the ants, bees and wasps (Order *Hymenoptera*). We will therefore begin by considering the homes of this group.

Probably the most familiar of these homes are the nests of the social wasps. The large pendant nests of *Montezumia nigriceps* Spin. are familiar objects in this country and are constructed of a very brittle papery substance; they are usually 9-12 inches in length but may measure as much as 3 feet 6 inches long. The nests of this species are cylindrical with the entrance at the bottom.

The forest species *Chartergus chartarius* Oliv. builds a nest of much the same design, but here the covering for the cells is of a cardboard-like substance and not easily broken. Owing to this fact these nests are often seen preserved as curios in this colony.

Not so highly developed, though still high in the scale, are the wasps that build the saucepan-cover nests. Here a number of cells are joined together and attached to their support by a small pedicel, these builders, however, make no covering wall. Our commonest examples of this type are the homes of the Brown Marabunta, *Polistes canadensis* L. var. *amazonicus* Schulz, which can almost always be seen about railway stations or under bridges and houses in the country.

Familiar objects to everyone must be the little mud homes of the 'mason bees' *Eumenes canaliculata* Oliv. Those little earthen flasks about $\frac{3}{4}$ of an inch in diameter which we find so often attached to the electric-light wire, on pictures, the ceiling or other such places, are the homes of this insect. In these little domes the eggs are laid and a number of caterpillars, paralysed by a sting from the parent wasp, are placed therein so that when the young larvae hatch there is an ample food supply for them. Sealed within these cells the larvae undergo their changes and eventually emerge as adult wasps.

Very like the above in their habits are the wasps *Sceliphron fistulare* Dahlb. only in this case the parents store up spiders. The architecture of their homes too is different, for they build cells about $1\frac{1}{4}$ inches long, parallel to each other and usually against a wall, though sometimes nests are found on a pendant object in which case the support is encircled. When each cell has been provisioned the wasp closes the entrance and finally smears the whole surface over so that the arrangement of the cells is imperceptible. Development proceeds within the cells and eventually adult wasps emerge by biting holes through the structure.

Absolutely different in their habits are the burrowing wasps, and for our example we will take the common 'cow-fly tigers,' *Monedula signata* L. Not only the appearance, but to a large extent the habits of these insects are described by the name 'cowfly tigers,' given them by the creoles. In colour they are a light green being variously marked with bars and blotches of black, very much after the manner of a jaguar, and their food is largely composed of 'cowflies' (*Tabanidae*). These insects build their homes by burrowing into the ground, showing a preference for sandy soils. Along with this habit of digging there has developed a number of spines on the forelegs of these insects which must greatly help them in their digging operations. In the burrow which the female makes she lays an egg and the larva which hatches from this is supplied with flies previously paralysed by its parents. When fully grown a cocoon is spun and eventually an adult 'cowfly tiger' emerges.

Unlike any of the above in their habits are the wood-boring bees so well represented by our large *Xylocopa fimbriata* F., and the small *Meliponas*. Our large *Xylocopas* are such busy fellows that we should certainly know about their homes. As we have previously said, they are wood borers, and with their strong mandibles they make tunnels several inches deep and about $\frac{3}{4}$ of an inch wide. At the bottom of the tunnel a ball of honey and pollen is placed and on this an egg is laid. A short distance above this the bee places a wad of sawdust, stuck together by a secretion of its own, to close the cell and at the same time form the floor of the next cell. In the cell above the same thing happens until the tunnel, which usually consists of 3 or 4 cells, is filled. It can at once be seen that the bottom cell will contain the oldest insect which, when it was ready to emerge, would be unable to do so had it not some unusual method. These insects have developed a peculiar habit to overcome this difficulty and the freshly emerged adult bites its way out by forming another tunnel going off at right angles to its home, and through this tunnel, in succession, pass the newly formed bees.

The *Meliponas* on the other hand occupy hollows in trees. If the space is too big it is stopped at a suitable distance before the nest is formed, and the entrance is always reduced to a small hole by filling in the area with wax. These insects make complicated homes and the honey cells, the wax cells, and the cells containing the larvae are all kept separate and are often even of entirely different shapes.

In the Ants (Fam. *Formicidae*) we have probably the most highly developed house builders among the insects; they, however, are usually subterranean dwellers. The entire Family are remarkably intelligent and have received considerable attention. For our example we will consider the well-known and much written about 'Coushi' (*Atta cephalotes* L. et spp.) These ants agriculturists probably know only too well, for many, particularly those on our river lands, suffer from their depredations; but apart from this they are highly interesting.

'Coushi' ants, in addition to making subterranean dwelling in which their young are brought up, have developed further in that they grow their food. The pieces of leaves cut from the plants by these ants are not eaten as is the popular idea, but are stored in chambers below the ground where a particular fungus grows on them and it is this fungus that forms the food of the ants. Here, as has already been pointed out, we have a very high development of this habit of home-building and probably the nearest approach to our idea of a home.

Termites (Order *Isoptera*) are another group of insects whose homes must be familiar to many in the tropics, and it is this habit of making a nest that has probably earned them the local name of 'wood ants.' The nests are familiar enough in this colony and can often be seen attached to paling posts, beams of houses, and stools of sugar cane.

While the nests found in this colony are small there are species to be found in Australia whose nests are taller than a man. The commoner type of nest here is spherical and about 12 to 18 inches in diameter but small conical forms about 2 feet high are also found locally. The nests are made from the wood which they destroy hardened by a secretion of the insects.

Among the butterflies and moths (Order *Lepidoptera*) the home building instinct is also present. The so common habit among the moths of forming a cocoon must be considered but a development in this direction for the protection of the pupae.

The larvae sometimes make shelters for themselves, and a fine example can be found in the often too prevalent Coconut Caterpillar, *Brassolis sophorae* L. In this species several dozen larvae draw the leaflets of a branch together by silken threads thus forming a cylindrical 'nest,' open at both ends, in which they hide during the day.

The larvae of the Guava Firetail Butterfly, *Pyrrhopyge amyclas* Cram., have a similar habit but in this case each larva makes a separate home by drawing together a couple of leaves. Leafrolling too is but another form of nest-building. In these examples we have the simplest types of homes—mere hiding places.

Very different are the nests of *Titya hirta* Druce, belonging to the Family *Lasiocampidae*. Here the larvae build a large sacklike nest of silk which may be as much as two feet long and in this they pupate. The adults when hatched make holes in this sack to emerge.

The well-known Brown-tail Moth of North America, *Euproctis chrysorrhoea* L. (Fam. *Liparidae*) has a similar habit and builds a nest of leaves, 5-6 inches in length, in which the larvae pass the winter; one of these nests may contain as many as 200 or more larvae.

Probably the most peculiar development of this habit is to be found in the Family *Psychidae* or Bagworms which is well represented by our *Oiketicus kirbyi* Gldng., whose homes are often to be seen about. The larvae of these insects build dwellings about 2 or 3 inches long of small bits of twigs over which they spin a tough silken covering, in these bags they live, carrying them around with them wherever they go. Later, when fully developed, the male pupates and emerges as a winged moth, the female remaining undeveloped and spending the whole of her life at home.

In the order *Hemiptera* examples can also be found. The familiar Cicadas or 'six o'clock bees' of this colony make underground dwellings in their nymphal stage, their tunnels extending several inches down. The well known 'seventeen year locust' *Cicada septendecim* of North America it must be remembered is really a Cicada and spends its entire nymphal stage, lasting close on seventeen years, in the ground.

Those small but so important insects which we call Scale Insects (Fam. *Coccidae*) must be considered among the housebuilders. In this Family the female makes a covering for herself in the form of a scale while the male is winged and free living. The coverings of these insects vary somewhat, being rudimentary in some, waxy in others, and often hard and chitinous. It is worthy of notice that in the control of these insects it is against their homes that measures are directed and in this way the young as well as the adults are destroyed.

Hardly to be considered as home builders are the *Fulgoridae* or Lanternflies and the *Cercopidae* or Froghoppers, both belonging to the Order *Hemiptera*, but they might be mentioned here on account of their methods of protecting their young.

For our example of the *Fulgoridae* we may consider the beautiful shell-like insect so common on Saman trees (*Pithecolibium Saman*) in this colony and known scientifically as *Poekilloptera phalaenoides* L. The young of this insect are covered with a thick wooly excretion and when abundant in the dry season they thickly cover the limbs of these trees giving one the impression of a light fall of snow. This Family is best represented in Tropical America where the largest forms are to be found.

The habits of the *Cercopidae* or Froghoppers are well known and the name of 'spittle insects' comes from the habit the nymphs have of surrounding themselves with a froth-like excretion.

Different from all the homes we have studied are those of the Caddice flies (Order *Trichoptera*) for here we have subaquatic dwellings, the earlier stages of these insects being passed under water. Both the type of dwelling and the material used differ according to genera, some of the simpler forms covering themselves with bits of stick arranged longitudinally and held together by silken threads, while other forms arrange the bits of stick horizontally and even cover them with moss and snails, both dead and living. Other forms again make their homes of stones; all, however, keep the material from which the home is erected together by means of silken threads.

Probably the most curious dwellings made by Caddice flies are those found beneath rocks and in waterfalls. They are often very simple consisting only of a few pebbles attached to the rock by threads, and between these pebbles the worm makes a perfect tube of silk in which it lives. These Caddice flies are fishermen and if one looks, their seine can be found, stretched between two stones, usually funnel-shaped, and opening up stream; they thus form traps for the small creatures that come rushing down with the current and which form the food of this carnivorous group of Caddice flies. When these nets occur on the brinks of waterfalls they assume the form of semi-elliptical cups which are kept distended by the current.

Homebuilding is less pronounced among the *Coleoptera* or Beetles than in the Orders previously mentioned but the larvae of *Curculionidae* or Weevils make tough fibrous cocoons for the protection of their pupae. Perhaps our commonest examples are the Palm Weevil, *Rhyncophorus palmarum* L., and the Sugar cane weevil *Metamasius hemipterus* L.

In the Family *Scarabaeidae* although we do not find a home actually built we have the parents making provision for their young in a peculiar way. In the group of this Family popularly known as the Tumble-bugs both male and female form round balls of dung, often several times as large as their combined sizes, which are sometimes rolled long distances. The balls are finally buried in the ground and the female deposits an egg on each so that when the larvae hatch these balls serve as their food.

The Order *Diptera* or Flies is but slightly developed in this direction and the habit of home building is only to be found in the Family *Cecidomyiidae* or Gall gnats. The adults are small and delicate flies and on this account are probably not often noticed. The larvae, however, are often very important and the now celebrated Hessian Fly, *Mayetiola destructor* Say, the most serious pest of wheat in North America, belongs to this group.

Our most familiar local representative is the Cassava Gall (*Cecidomyia? manihoti* Felt). At times hundreds of these galls can be seen on the leaves of a single plant. This Family has received but little attention in this colony.

Cockroaches, Locusts, Grasshoppers, Crickets, and Godhorses (Order *Orthoptera*) have home-building instinct least developed. Some Crickets (Fam. *Gryllidae*) do make burrows in the ground in which they hide but in this Order the majority of the members only provide protection for the eggs.

Cockroaches (Fam. *Blattidae*), apparently prefer the homes of man and the familiar egg cases of our cockroaches (*Periplaneta americana* L. et many spp) offer good examples of egg protection. The egg cases are however sometimes themselves protected by a covering of fragments of their surroundings such as bits of paper.

The God-horses (Fam. *Mantidae*), or Praying Mantids as they are called in other countries, also form egg-cases which they attach to stems and branches.

In the Locusts and Grasshoppers we have modifications in their structure to help them in hiding their eggs. Locusts (Fam. *Acerididae*) have egg guides which they use to bore into the ground where they deposit their eggs while the Grasshoppers (Fam. *Locustidae*) have long sword-like ovipositors which must be of the greatest value to them as their eggs are usually laid in the stems and root-leaves of grasses or the pith of twigs.

Crickets (Fam. *Gryllidae*), as already explained, form burrows for themselves and along with this habit their forelegs have greatly developed. They are also provided with ovipositors which are not so well developed as in the grasshoppers.

The question naturally arises as to what is the object of these homes. Of course the answer is 'for protection'; but let us see in what way they offer this protection. The simplest form of protection is probably against weather conditions, for either excessive heat or excessive rains would be inimical to the earlier stages. The most important function, however, is probably as a protection against enemies. The simple hiding-places which larvae make by drawing together a number of leaves, or merely rolling one, protect them, not only from birds which are forever preying upon them, but also from enemies of their own kind such as parasitic *Hymenoptera* and *Diptera*. The tiny homes of Caddice flies (*Trichoptera*), protective, no doubt, against fishes, water beetles (*Hydrophilidae*, etc.), dragon fly larvae (*Odonata*), and other aquatic insects; the cocoons of moths (*Lepidoptera*), and even the complicated homes of the bees and wasps (*Hymenoptera*) have probably all been developed for the same purpose. To a large extent these protections succeed, but the parasitic insects have, of necessity, themselves developed in other directions so as to overcome these obstacles for it is only thus that the balance of life is maintained.

THE INDIANS OF BARBADOS.

BY E. G. SINCKLER.

In his *English in the West Indies*, published in 1888, Mr. James Anthony Froude, the historian, writing of Barbados, states (page 33) :

“ Little is known of the island before we took possession of it—so little that the origin of the name is still uncertain. Barbados, if not a corruption of some older word, is Spanish or Portuguese, and means ‘ bearded.’ The local opinion is that the word refers to a banyan or fig-tree which is common there, and which sends down from its branches long hairs or fibres supposed to resemble beards. I disbelieve in this derivation. Every Spaniard whom I have consulted confirms my own impression that ‘ Barbados’ standing alone could no more refer to trees than ‘ barbati’ standing alone could refer to trees in Latin. The name is a century older than the English occupation, for I have seen it in a Spanish chart of 1525. The question is of some interest, since it perhaps implies that at the first discovery there was a race of *Bearded Caribs* there.”

As the English when they took possession of the island in 1605, and again when they settled in it in 1627, are stated to have found *no* inhabitants in it (if we exclude the fact of the bay called “ Six men’s bay ” in St. Peters) the question arises *was the island ever inhabited?*

The Rev. Griffith Hughes, Rector of St. Lucy’s Parish, in his “ Natural History of Barbados ” (published in 1750) proves that it *was* inhabited (“ for at least certain seasons of the year.”) He states :—

“ Former descriptions of this island begin with barely mentioning its discovery by the Portuguese, and the settlement of the English there in the reign of King James the First in the year 1625,* without the least enquiry, whether it had ever been before inhabited, and by whom. It is, indeed, said that some of the first discoverers of this island found *no* inhabitants upon their arrival. However we ought not to conclude too hastily, that there never were any, until what is offered to prove the contrary, be fully considered. I was, indeed, once partly inclined to that opinion, induced to it from the remoteness of this, from the whole cluster of islands, *viz.*, St. Lucia, Dominico, Marygalant, Guardaloup, St. Christopher’s, Antigua, and St. Vincent ; which last, though nearest, is about 100 miles distant. And as most of these are in sight of one another, they are more convenient for mutual commerce in time of peace, and embarkation in time of war. And what gives several of these the advantage over this island with regard to an *Indian* settlement, is their far greater number of open bays and rivers, stored with tortoises, and almost an incredible plenty of fish. But as we have had late instances of their coming

*The late Mr. N. Darnell Davis C.M.G., proved this date to be incorrect—the correct date being 1627.

hither from *St. Vincent's* in their small canoes or Perriawgers, even for their pleasure, I concluded, that they might formerly, more probably, come for their interest ; especially at certain seasons of the year, when the fishing or game in the other islands, grew either scanty or shy, by being too often disturbed.

“ These probable conjectures, upon a farther inquiry were corroborated by the suffrage of many aged persons ; several of whom were between eighty and ninety years old, who, not only agreed in their received tradition that there were *Indians* formerly in this island, but likewise some of them added farther, that their frequent arrival to, or departure from it, was always in the wane of the moon, for the benefit of light nights and that when a difference arose between them and the *English*, the *Indians* retired to their fastnesses in the woods ; and that in their way down to their canoes, they would artfully hide themselves with coverings of green boughs, to elude the search of the *English*.

“ Now, since the parents of these aged persons, who give this account might be old enough to be eye-witnesses of these things ; such and so early a testimony, where they had no apparent inducement to deviate from the truth must at least, be allowed to carry with it the usual weight and credit in such cases, till these conjectures, strengthened by tradition, and confirmed by apparent facts, grow to such a degree of certainty, as to leave every doubt inexcusable.

“ The method I shall take to prove their former residence in this island will be to make it appear *First* ; that there are several places in this island called, to this day, after their names. *Secondly*, that in these very places there are *daily* dug up such marks of their former residence, as were peculiar to *Indians*. *Thirdly*, I shall compare these several evidences with those confessedly satisfactory ones, in almost parallel cases. I shall begin by observing that the *Indians*, who inhabited this island could in all probability be no others than colonies from some of the *Leeward Islands*, most probably from *St. Vincent*, *St. Lucia* or *Tobago*. From either of these, according to their situation, with respect to Barbados, as well as with regard to a safe harbour, they must probably land to the west, or west-south-west of this island. Accordingly as *Carlisle Bay* is the largest and most commodious harbour, it is natural to suppose that they landed here and made the adjacent part of the island their place of residence. This is evidently confirmed by the buttings and boundings of several tenements near this bay ; which in very old deeds, are said to terminate at or within a certain distance from the *Indian Bridge* ; from which the great number of houses built about this convenient place, came soon afterwards to be called *Bridge Town*. The above-mentioned bridge was placed over that part of the creek, or narrow neck of the bay, which divides Major *Gidney Clark's* house from Colonel *John Fairchild's*.* The necessity that the *Indians*, residing on the

*Now Fairchild Street, Bridgetown.

north side of this creek, were under to make a bridge (which in all likelihood consisted of no more than a few trees, felled down, and laid across this creek) will appear when we consider that their best and almost only supply of fresh water, was on the south side of it at a place now called *Hannington's Spring*.*

"The next small rivulet running to the sea to the leeward of *Bridge Town* is at present, as well as in many old deeds, called *Indian River*. It was likewise at this place that some *Indians* from *St. Vincent's* landed in or about the year 1738. And as *Indians* are remarkably nice in choosing a dry healthy situation, this, with so few or no footsteps of their long abode here gave me room to believe, that they kept moving along the seashore so long as they met with convenient fishing bays.

"As the bays near the *Hole Town* were well stored with fish this seemed to be their *second* settlement from *Indian River*; but as it was necessary in stormy weather, to provide a shelter higher up in the country I found several remains of their abode, under the shelter of a high cliff, in the estate of Samuel Barwick, Esq., deceased. We are likewise informed by tradition that five *Indian* women, upon promise of good usage from the *English*, upon the desertion of the rest of the *Indians* lived and died in that place: and about two miles from hence, there is a tract of land called *Indian Wood* or *Indian Town*.

"And as the last of these, of any note, to the leeward of the island, is *Six Men's Bay*, and *Rider's Bay*, let us but allow these to be then, as they are at present, as well stored with fish as any other, and we shall soon fix their residence, for at least a while, in this convenient place: for these *Indians* (as shall be presently shewed) were but ill provided with tools to fell timber. This joined to their great indolence caused them to search (especially in wet seasons) for their natural sheltering place, the first convenient cave; and, as there is a very commodious one in the side of a neighbouring hill, called to this day the *Indian Castle*, and almost in a direct line from *Six Men's Bay*, and not above a mile and a half off, in a pleasant part of the country, it is more than probable that they should pitch upon this being very commodious. But what made this place more complete (and affords, I think, an undoubted proof of their residence here) is an adjoining clayey bottom, where they dug a Pond or Reservoir to hold rain-water; and which place is, and hath been since the memory of the oldest neighbours alive, called the *Indian Pond*—with part of the clay which they dug out, they made their earthenware, such as pots and pans, and, like the idolaters of old, out of the same materials they made to themselves Gods and worshipped them. Among several broken fragments of idols, said to be dug up in this place, I saw the head of one, which alone weighed above sixty pounds weight. This before it was broken off stood upon an oval pedestal above three feet in height. The heads of all the others that came within my observation

*Now known as "Beckles Spring," Bay Street.

were *very small*, one of these weighed 15 ounces : and all were of clay burnt. These lesser idols were in all probability their *penates*.

“ The last proof of their residence in this place is a great number of their stone hatchets and chissels that are here dug up. The use of these hatchets and chissels, was in all likelihood to cut down *timber*, to make huts, where they had not the conveniency of caves : as well as, with the help of fire, to fell some of the largest kind to make canoes. These, I imagine, after they were roughly squared, were half burnt with live coals ; and then, with their *scooping Chissels*, they, by degrees, made them hollow. Some of the hatchets, and a great number of the chissels, especially the scooping ones, are made of the most substantial inside part of a conch-shell ; others of the hardest common stones : and a few of the cutting sort of a stone of an opaque greenish colour.

“ Having proved their residence in this place, it will not be surprising to those who know the roving disposition of the *Indians*, to find that they moved under the shelter of the hills, and almost always at equal distance from the sea, till they came to a large convenient cave, under a hill called *Mount Gilboa*, in the estate of Colonel *John Pickering* : where I found several of their broken images, pipes, hatchets, and chissels. . . . It was natural and customary for them to ramble in search of spring-water, which at a little distance from hence they found in the Estate of *Edward Bonnett, Esq.* Here they settled near a small perennial spring. . . . the soil being very proper to produce yams, plantain and banana trees : but as there was no cave to afford shelter, they were obliged to cut down timber to build huts : and from thence, in all probability, it comes, that there are found about this place of their residence so many fragments of broken hatchets, chissels and pots.

“ There are not only near this place, but likewise at *Maycocks Bay*, *Joan's Hole*, *Cluffs Bay* and near *Scotland church*, as well as in other places, many tokens of their former abode.”

From these *Indian* settlements and the large number of idols, hatchets, chissels, and other *Indian* tools found in Barbados the Rev. Mr. Hughes came to the conclusion that the island *was* the residence of Indians.

As regards the derivation of the name “ Barbados ” he is doubtful for he states :

“ Among many *uncertain* conjectures, those who derive the name given to this island, from the Portuguese language are most probably in the right : . . . Nothing could be more surprising to Europeans than to see the shores shaded with a kind of fig trees, differing from all other trees in the manner of their growth, for from their branches hang innumerable small filaments growing downwards, till they touch the earth. These thread-like resemblances have been called by the *English* from the

first settlement of the island to this time, the '*Beards*' of the fig trees ; and in all probability the Portuguese *might* originally have the same notion of their resemblance, and from thence called this, *and the neighbouring islands conjunctly Las Barbados*, i.e., *the Bearded Islands* ; for *Barbada* in that language signified anything bearded. And when this island came to be inhabited by the *English* it retained the *general name* given originally to the *whole*."

This "conjecture" of Mr. Hughes is not borne out by history, nor by the maps : it is like the other "conjectures"—uncertain. He states all the islands were, as a group, called *Las Barbadas*.

In Poyer's "History of Barbados," (published in 1808) the author states : "From the Portuguese the island obtained the name of *Las Barbadas*, in allusion, as some writers have supposed, to the *barbarous inhospitable state* of the country." He, however, states, that Hughes (before him) "conjectures" the appellation to have signified "The Bearded Island" from the vast number of Indian fig trees.

Poyer (who was a Barbadian) is of opinion that Hughes did not prove that Indians permanently occupied the island : he only proved that Caribs from the adjacent islands visited Barbados for the purpose of fishing and hunting, and perhaps for procuring clay for making domestic utensils. He (Poyer) states that the Carlisle Settlers erected the bridge from which Bridgetown derived its name. He also states that the English Settlers (like the Spaniards before them) had recourse 1647 to the practice of kidnapping the Indians and enslaving them. This entrapping caused the Caribs dispersed through the Windward Islands to land where the English settlements were accessible to their canoes, and massacre the settlers with remorseless vengeance. They did not, however, attack the settlers in Barbados.

Sir Robert Schomburgh in his "History of Barbados" (published in 1848) asserts that Barbados was inhabited by *Indians*, and that the Spaniards wiped them off the face of the earth. He states (page 255.) :

"The researches which I have devoted to the earlier historians of the New World have afforded me proofs that Barbados was known to the *Spaniards* as early as the commencement of the sixteenth century, and apparently supplied *Indians as slaves* for their mines in *Espanola*. *Las Casas*, through his generous and constant exertions in favour of the natives of South America, procured from Charles the Fifth some amelioration of their condition ; and the Licentiate Rodrigo de Figueroa was sent as Juez de Residencia to *Espanola*, with instructions to allow the Indians to live by themselves in their own villages, and that all who requested it should be set at liberty : and as the *Indians* from *Trinidad* had been taken for slaves under the pretext of their being *Caribs*, the evil was to be remedied and

all who had been brought to Espanola from "the *Barbados*" and Gigantes were to be treated as natives. The mere occurrence of the name of the Isla de los Barbados might be considered accidental had not Herrera identified it in the geographical description of the islands appended to his history, where the situation is so far correct that it cannot be mistaken. (Charles the Fifth issued his instructions to Rodrigo de Figueroa in 1518; Herrera published the first part of his history in 1601; and during that interval the island of Barbados is not lost to sight.

"It is scarcely to be conceived that an island occupying such a prominent position as Barbados should have been left undiscovered by the Portuguese as it lies almost in their course to and from Brazil. It is equally improbable that it should have remained unknown to the Spaniards who in the sixteenth century made frequent voyages from Espanola to Trinidad and Costa Firme; indeed the instructions of the Licentiate Figueroa prove that it was resorted to by the Spaniards for the purpose of enslaving Indians. Mr. Hughes' opinion that it must have been formerly permanently inhabited by Indians, grounded upon the number of Indian implements and utensils found in different spots in the island, is therefore borne out by my researches."

Hughes and Schomburgk prove Barbados was permanently inhabited by Indians. Indian implements, utensils and small "heads" (probably Indian penates) are at present found nearly everywhere in Barbados—and there are names all over the island, such as "Indian River," "Indian Grounds," "Indian Caves," Six Men's Bay, "Three Houses" and "Indian Ponds" which proved these Indians were permanently settled in the Island. When it is remembered that the Spaniards depopulated the Bahama Islands of their forty thousand Indian inhabitants, to work the mines in Hispaniola, in the short space of five years, there is nothing improbable in their depopulating Barbados of its Indians.

The next question is: Are *Bearded* Indians a fact? Is Froude's idea of a "*Bearded Carib*" a monstrosity?

Though the courtesy of Mr. J. Graham Cruickshank Dr. Roth, Magistrate in the Pomeroon District, British Guiana, whose knowledge of the Indians is extensive, stated: "Of course there are *bearded Indians* in South America—but one must bear in mind that depilation was and is still very common. Many of the older Indians even in this district (mainly Arawaks and Warraus) have something of a tuft so to speak On the Orinoco certainly a couple of centuries ago the Otomacs and Guanós grew beards. In our own colony there are records of beards among the Partamonas, Akawais, and Macusis—all three of them of the *Carib* stock."

In "*Timehri*" (June, 1917) Mr. A. Hyatt Verrill, in writing of "The Tribal Relationship of the Akawois, states: "Both the *insular* and

mainland Caribs have well developed *beards*, and many of the Arowaks have quite luxuriant moustaches."

The island therefore may have been inhabited by *bearded Indians*: and it is worthy of note that the trees that *grow on the shores* of Barbados are *not* "fig trees:" they are manchineel, white wood and cocoanut-palms. The Barbados fig-trees, as a rule, grow in "gullies" and ravines. The only "Bearded Fig tree" I have seen growing on the beach is one growing in a rock at Sinckler's Bay in the parish of St. Lucy. Why should the Portuguese have gone out of their way to name the island from a fig tree in the *interior*? It is purely legendary and it has, perhaps, as much truth in it as the statement that the Portuguese left "hogs" for breeding purposes on the island, whereas, as Schomburgk points out, these "hogs" were indigenous. (the Peccary or *Dicoteles labiatus* and *D. torquatus* common to the larger islands.)

In a paper read by the Rev William Griffith, M.A., Fellow of St. John's College, Cambridge, before the Cambridge Antiquarian Society in 1873, Mr. Griffith writes:—

"In default of stone for their implements the *Native Charibs* in Barbados were driven to the next best material *shell*. This was usually the central spire, or the spreading undulating lip of the Queen Conch, either in its natural or fossilised state. They (the Indian implements) are found specially in the neighbourhood of the *Springs* which are met with at intervals. These afford the only fresh water in the Island and would naturally be the sites for *Charib Villages*."

And he adds that when he was at Codrington College, Barbados, whilst a thick stratum of mud was being removed from the College Springs very many of these Indian shell instruments were found. He writes of the *Native Caribs*, it will be noted.

Many collections have been made of these *Indian* implements and utensils from time to time. Mr. E. K. Taylor, late Queen's Solicitor had a large collection of them: Mr. J. L. K. Pedder of "Heywoods," St. Peter (at which plantation there is a large swamp) has a fine collection, and so has Dr. John Hutson, Public Health Inspector.

As regards the few *Indian* implements in my possession (of which Mr. Walter Parkinson at the Bridgetown Club has kindly taken photographs of some) they were chiefly collected at "Gibbes" and "Carlton" plantations (St Peter's and St. James) where *Springs* are located. One of the small "heads" was found at "Indian Mount," St. Lucy, and the largest was found at "Indian River" by Mr. E. K. Taylor.* I have a small "head" found at "Indian Mount" St. Lucy, which resembles the one given in an engraving in Hughes, "Natural History of Barbados"

* Poyer states that this river obtained its name from the *Indian* implements and utensils found there.



POTTERY AND STONE IMPLEMENT.



SHELL IMPLEMENTS.

(Figure II), page 7. It is evidently a representation of the face of the Moon: and I have also a beautifully polished miniature axe made of a dark green stone (not the whitish-green axe photographed by Mr. Parkinson), which specimen the Rev. Father C. Cooksey, S.J., stated was a valuable one, and which he referred to in his paper on "The First Barbadians, published in "Timehri" of July, 1912. Father Cooksey was of opinion that the first Barbadians were *Indians*, but few in number, and "consisted of waifs who drifted "into the Atlantic from elsewhere" (perhaps Tobago). Although I do not concur in his conclusions, his essay is bright and interesting.

For my part I believe that the natives of Barbados were *Indians* (not Caribs who were cannibals): that they were completely exterminated by the Spaniards: and that is why the *English* settlers only found *six* at "Six Men's Bay." And whatever may be the derivation of the name "Barbados" I do not believe the name was derived from fig-trees. Schomburgk states that in the British Museum there is a map of the world executed before 1536, and that the island on this chart appears under the name of "Bernados." He also, states that in a map of the world by Juan de la Cosa, executed in 1500, which exhibits the "Islas Canibales," Barbados is *omitted*. This tends to prove it was inhabited by *Indians*, and was the island alluded to by Charles the Fifth in his instructions to the Licentiate Rodrigo de Figueroa.

Note—In "Transatlantic Sketches" by the Rev. Greville John Chester, B. A. (published 1869) the author writing of Fontabelle, Barbados, states:

"It is bounded by a small stream, called "Indian River" by the first settlers; an indication that the aborigines were not then extinct. In this neighbourhood the ancient Carib shell implements are particularly abundant, and testify, there as elsewhere, to a *long continued*, and not, as is commonly supposed, to an only occasional residence on the part of those who used them. . . . These Indian remains are found so universally and in such large numbers as to put the existence of a large *stationary* population beyond a doubt. The shell implements are not found in any of the other Islands I have given a large series to the Christy Collection of the British Museum.

SOME OF THE CONSTRUCTIONAL WOODS OF BRITISH GUIANA.

—

Descriptions by L. S. Hohenkerk of the Department of Lands and Mines.

—

Weights per cubic foot, Moduli of Rupture and Elasticity and Breaking Weights of test bars, calculated and determined from actual experiment by L. P. Hodge, Assoc. M. Inst. C. E. of the Department of Public Works.

—

Plates showing the test bars after fracture from Photographs by the late J. Williams, F. C. S., of the Department of Science and Agriculture.

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INTRODUCTION.

According, to a List recently compiled by Mr. L. S. Hohenkerk ("Timehri" Vol. IV, 1917) the known timbers of British Guiana comprise some 250 distinct woods. Of these 17 of the best known or most representative varieties were selected for experiment by the Public Works Department in 1911 with the results tabulated in the following pages.

From the scale diagram of relative transverse strength it will be seen that 13 out of the 17 specimens were better able to resist transverse stress than oak, pitch pine, teak or mahogany.

Fourteen of them were stronger than Jarrah, Northern Pine (*Pinus Silvestris*) or White Pine (*Pinus Strobus*) and 15 were stronger than white fir or spruce (*Abies Excelsa*).

It will therefore be obvious to the users of other timbers that the employment of most of the Colony woods will effect considerable economy in the quantity required for strength, which should be borne in mind when considering the question of cost.

PLATE 1.

Kakatará bally.

Upper Specimen—	Weight per cub. ft.	45·43 lbs.	lbs. per sq. inch
	Modulus of rupture		12,521.
	Do. of elasticity		1,581,364
	Breaking weight	6·21 cwt.	

Description.

Soft, light, coarse grain, light colour, suitable for drawers and internal fittings.

Price per 1,000 feet B.M. f.o.b. Georgetown.—

Futui (or Photee).

Middle Specimen—	Weight per cub. ft. 24.2 lbs.	lbs. per sq. inch
	Modulus of rupture	6,559
	Do. of Elasticity	1,444,727
	Breaking weight 32.4 cwt.	

Description.

Resembles white pine, planes well but turns badly.
Price per 1,000 feet B.M. f.o.b. Georgetown.—

Greenheart (Nectandra Rodioei).

Lower Specimen—	Weight per cub. ft. 68.4 lbs.	lbs. per sq. inch
	Modulus of rupture	22,680
	Do. of Elasticity	3,840,000
	Breaking weight 11.25 cwt.	

Description.

Rated first class at Lloyds, said to be the best timber for resisting tensile and compressive strains. Resists *Limnora terebrans* and *Teredo* and ranks next to teak in resisting white ants, world-wide reputation for submerged work of all kinds. Can be had up to 24 inches square x 70 feet long.

Price per 1,000 Ft. B.M. f.o.b. Georgetown.—

PLATE 2.

White Silverballi (Nectandra sp.)

Upper Specimen—	Weight per cub. ft. 36.28 lbs.	lbs. per sq. inch
	Modulus of rupture	10,566
	Do. of Elasticity	1,949,125
	Breaking weight 5.24 cwt.	

Description.

Uniform greenish or yellowish color, surface lustrous brilliant and satiny, suitable for inside wall boarding. Logs procurable up to 30 ft. x 8-9 inches.

Price per 1,000' feet B.M. f.o.b. Georgetown.—

Wadara.

Middle Specimen—	Weight per cub. ft. 53.17 lbs.	lbs. per sq. inch
	Modulus of rupture	18,150
	Do. of Elasticity	3,865,166
	Breaking weight 9.00 cwt.	

Description.

Price per 1,000 feet B.M. f.o.b. Georgetown.—

Red or brown Cedar, or Kurana (Cedrella odorata.)

Lower		
Specimen—	Weight per cub. ft. 19·8 lbs.	lbs. per sq. inch
	Modulus of rupture	5,724
	Do. of Elasticity	987,428
	Breaking weight 2·83 cwt.	

Description.

A handsome reddish brown wood much used for drawers and cigar boxes as insects and vermin avoid it.

Grows up to 100 ft. and squares up to 40 inches.

Fairly plentiful.

Price per 1,000 feet B.M. f.o.b. Georgetown.—

PLATE 3.

White Cedar or Warikurri (Tabebuia longipes).

Upper		
Specimen—	Weight per cub. ft. 41·68 lbs.	lbs. per sq. inch
	Modulus of rupture	12,429
	Do. of Elasticity	2,425,263
	Breaking weight 6·165 cwt.	

Description.

Easily worked, durable underground but liable to split on exposure to the sun, used for oars and paddles, logs 40 ft. x 12 ins.

Price per 1,000 feet B.M. f.o.b. Georgetown.—

Kocroo keorule.

Middle		
Specimen—	Weight per cub. ft. 38·44 lbs.	lbs. per sq. inch
	Modulus of rupture	13,081
	Do. of Elasticity	3,162,729
	Breaking weight 6·48 cwt.	

Price per 1,000 feet B.M. f.o.b. Georgetown.—

Dukalli.

Lower		
Specimen—	Weight per cub. ft. 36·89 lbs.	lbs. per sq. inch
	Modulus of rupture	9,740
	Do. of Elasticity	2,233,125
	Breaking weight 4·831 cwt.	

Description.

Grows fairly large, tall and straight, makes good boards for internal work.

Price per 1,000 feet B.M. f.o.b. Georgetown.—

PLATE 4.

Konoko.

Top

Specimen—	Weight per cub. ft. 61·82 lbs.	lbs. per sq. inch
	Modulus of rupture	14,296
	Do. of Elasticity	2,495,845
	Breaking weight 7·09 cwt.	
	Price per 1,000 feet B.M. f.o.b. Georgetown.—	

Kakaralli (Lecythis sp. or Lecythis ollaria ?)

Second

Specimen—	Weight per cub. ft. 51·95 lbs.	lbs. per sq. inch
	Modulus of rupture	13,378
	Do. of Elasticity	2,375,257
	Breaking weight 6·63 cwt.	

Description.

Hard, heavy fine grain, dense, reddish or greyish brown, said to resist Teredo and Barnacles, common throughout the colony; in places abundant, average height 80 ft, squaring 16 inches.

Price per 1,000 feet B.M. f.o.b. Georgetown.—

Brown Silverballi (nectandra sp.)

Third

Specimen—	Weight per cub. ft. 43·55 lbs.	lbs. per sq. inch
	Modulus of rupture	13,196
	Do. of Elasticity	2,523,669
	Breaking weight 6·545 cwt.	

Description.

Colour cedar brown to dark brown with black patches here and there, specially adapted for boat-building, not plentiful. Logs 50-60 feet x 18-20 inches.

Price per 1,000 feet B.M. f.o.b. Georgetown.—

Mora (Dimorphandra Mora).

Bottom

Specimen—	Weight per cub. ft. 60·937 lbs.	lbs. per sq. inch
	Modulus of rupture	14,644
	Do. of Elasticity	2,297,794
	Breaking weight 7·26 cwt.	

Description.

Planes well and smoothly when of good quality, turns badly, polishes well. Rated one of the 8 first-class timbers at Lloyds, resists dry-rot, but not the Teredo. Very durable, more so than Teak, one of the best woods for railway sleepers and paving blocks. Makes good durable furniture. Abundant all over the Colony. Often grows to 200 feet and can be had to square 24 ins. free of sap or holes.

Price per 1,000 feet B.M. f.o.b. Georgetown.—

PLATE 5.

Yellow Silverballi (Nectandra sp.)

Top		
Specimen—	Weight per cub. ft. 34·9 lbs.	lbs. per sq. inch
	Modulus of rupture.	10,958
	Do. of Elasticity	1,767,890
	Breaking weight 5·43 cwt.	

Description.

Chiefly used for the upper planking of boats, average height 60 ft., small trees giving 8 in. to 10 in. boards readily procurable.

Price per 1,000 feet B.M. f.o.b. Georgetown.—

Crabwood (Carapa guyanensis).

Second		
Specimen—	Weight per cub. ft. 45·91 lbs.	lbs. per sq. inch
	Modulus of rupture	14,095
	Do. of Elasticity	2,124,964
	Breaking weight 6·99 cwt.	

Description.

Very much resembles Mahogany but runs much darker and when polished assumes a walnut rather than a mahogany colour. A handsom furniture wood. Logs 40 ft. by 9 in. to 14 inches. Plentiful throughout the Colony.

Price per 1,000 ft. B.M. f.o.b. Georgetown.—

Maporo-Kong.

Third		
Specimen—	Weight per cub. ft. 45·91 lbs.	lbs. per sq. inch
	Modulus of rupture	12,258
	Do. of Elasticity	2,081,598
	Breaking weight 6·08 cwt.	
	Price per 1,000 ft. f.o.b. Georgetown.—	

Determa (Nectandra Wana).

Bottom		
Specimen—	Weight per cub. ft. 39·88 lbs.	lbs. per sq. inch
	Modulus of rupture	7,494
	Do. of Elasticity	1,060,734
	Breaking weight 3·717 cwt.	

Description.

A pinkish red wood of uniform colour and general utility, much used in the Colony for masts and spars. Logs procurable from 30 to 40 ft. x 12 to 18 inches.

Price per 1,000 ft. B.M. f.o.b. Georgetown.—

Some of the Construal Woods of British Guiana.

Greenheart 11.25

Wadara 9.00

Mora 7.26

Konoko 7.09

Crabwood 6.99

Kakaralli 6.63

Brown Silverballi 6.545

Kocrookeorule 6.48

Kakatar-Balli 6.21

White Cedar 6.165

Mapara Kong 6.08

Yellow Silverballi 5.43

White Do. 5.24

Oak, English

Pitch Pine, American } 5.00

Teak Burmah

Mahogany, Honduras 4.9

Dukalli 4.831

Jarrah, Australian 4.5

Northern Pine (*P. silvestris*) 4.00

White Pine, American (*P. Strobis*) 3.8

Determa 3.717

Fir, white Spruce (*Abies excelsa*) 3.6

Futui 3.24

2.83 Red or Brown Cedar.

Scale Diagram showing the relative strength of British Guiana constructional woods compared with others in general use.

The figures represent the central Breaking Weight in Cuts. of test bars 1 inch square, ends supported at 1 foot (Those for the woods shown in Red are from Hurst's Architectural Surveyor's Hand Book)

Scale 4 cut. = 1 inch.

(Spon)

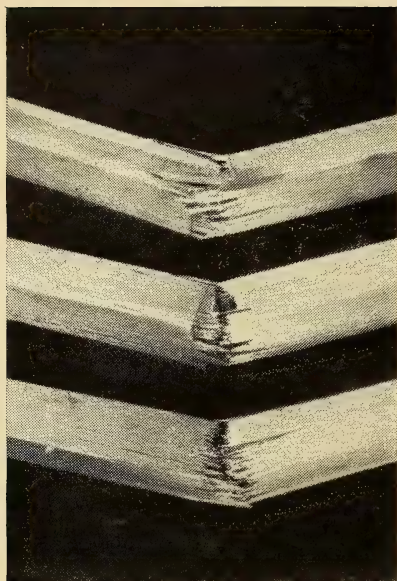
[clear spon.]

L. P. HODGE, Assoc. M. Inst. C.E.

17. 8. 17.



1. UPPER—KAKATARA BALLY. MIDDLE—FUTUI.
LOWER—GREENHEART.



2. UPPER—WHITE SILVERBALLI.
MIDDLE—WADARA.
LOWER—RED CEDAR.



4. TOP—KONOKO.
SECOND—KAKARALLI.
THIRD—BROWN SILVERBALLI.
BOTTOM—MORA.



3. UPPER—WHITE CEDAR.
MIDDLE—KOCROO.
LOWER—DUKALLI.



5. TOP—YELLOW SILVERBALLI.
SECOND—CRABWOOD
THIRD—MAPORO-KONG.
BOTTOM—DETERMA.

LIGNO CONCRETE.

A LARGE FIELD FOR THE UTILIZATION OF COLONY HARDWOOD.

BY L. P. HODGE, ASSOC. M. INST. C.E.

In these scientific days most of us are sufficiently acquainted with Physics to be aware that when a beam is loaded the upper portion is compressed and the lower portion is extended. The bending of a piece of indian rubber will make this quite clear. Consequently the strength of any beam depends upon the ability of the upper portion to resist crushing (or "compression" as it is more usually termed by the Engineer) and that of the lower portion to resist elongation (or "tension").

Concrete, being composed of small pieces of stone or some other hard material, has naturally a high resistance to compression. It has, however, so poor a resistance to tension that it is practically negligible. This defect has been overcome of late years by inserting iron or mild steel rods in the lower or tension part of the beam to take the whole of the tensile stress. This enables the beam to be made much smaller than would otherwise be necessary at a considerable saving in cost. Such concrete is termed "reinforced" because the rods reinforce the resistance of the concrete to tension, and when iron or mild steel rods are employed the conjunction is termed "ferro" concrete (*L. ferrum*, iron).

Iron or mild steel was selected for reinforcement on account of its high resistance to tension, but there seems no reason why other materials should not be substituted, the area in tension being increased as the resistance diminishes.

Experiments with concrete beams reinforced with wood by methods suggested by Mr. G. O. Case were carried out before the war and the results tabulated in an article by C. A. M. Smith, M. Sc. in "The Engineer" of December 16th, 1910, who termed the combination "ligno concrete." (*L. lignum*, wood) The woods experimented with were teak, deal, oak, ash, mahogany, Jarrah, tallow wood, and stringy bark, and to quote from the article "the results seem to show that equal strength can be gained either with wood or iron reinforcement, although, of course, the section of the wooden bars must of necessity be considerably larger than is required with steel bars. On the other hand this larger section is more than counterbalanced by the fact that wood is so much cheaper."

One result of the present War has been to considerably increase the cost of iron or mild steel reinforcement, and as present prices are likely to be maintained, if not increased, for many years to come, owing to a large anticipated demand for structural steel after Peace has been declared, the use of "ligno concrete," if better known, is likely to become extensive.

According to Mr. Smith's article previously referred to "providing proper adhesion takes place between the wood and the cement (and tests have shown this to be the case) the timber cannot fail by longitudinal shear, but can only break in pure tension." It will follow therefore that, other things being equal, preference will be given to that wood which has the highest resistance to tension." According to Rivington, Part IV. Table 1, the relative resistance to tension of the leading timbers of the world are as follow :

TIMBER.	Ultimate Resistance to Tension lbs. per Sq. Inch.		
	From.	To.	Ordinary.
Oak, British	5,800	19,800	10,000
Fir, Red Baltic	2,240	14,000	7,000
Pitch Pine	4,200	7,650	5,000
American Yellow Pine ...	1,800	2,800	2,000
Elm, English	4,620	14,000	5,500
Beech	4,850	22,000	11,000
Teak	2,590	21,000	10,000
Greenheart	7,980	9,380	8,800

It will be at once apparent that with the exception of English Oak and Beech, which are not available in large quantities, there will be only teak to compete with our greenheart as the most suitable wood for ligno concrete. And of the two, as will be seen from the above figures, greenheart has the advantage in uniformity, a matter of great moment in reinforcement.

In connection with the bridging of the East Coast Road deviation last year the writer experimented with burnt earth reinforced concrete beams of equal section and span, substituting greenheart bars for iron in the ratio of their assumed safe resistance to tension.

The results of the experiments are shown graphically in Figures 1 and 2. It will be seen that the ligno concrete beam failed with only $\frac{1}{10}$ less load than its ferro concrete competitor. It had, however, the advantage of nine days in age. A burnt earth ligno concrete pile was also cast as in Fig. 3 and successfully driven about 17 feet through clay as one of the abutment piles of the iron bridge over Triumph west side-line trench. It may be mentioned incidentally that this bridge is the first known to the writer, in which burnt earth piles have been employed. It is also the first instance known to him in which ligno concrete construction has figured in a permanent structure.

Taking the cost of small greenheart scantling at \$100 per 1,000 ft. B.M. = \$1.20 per c. ft. and common iron bars at £15 per ton = \$15.58 per c. ft. (present prices) the ratio of cost is about $\frac{1}{13}$, while the ratio of safe

Sectional Elevation of Pile $\frac{1}{4}$ " Scale.

LIGNO CONCRETE.

No. 5 S.W.G. plain iron wire
bands at 1 foot centres.

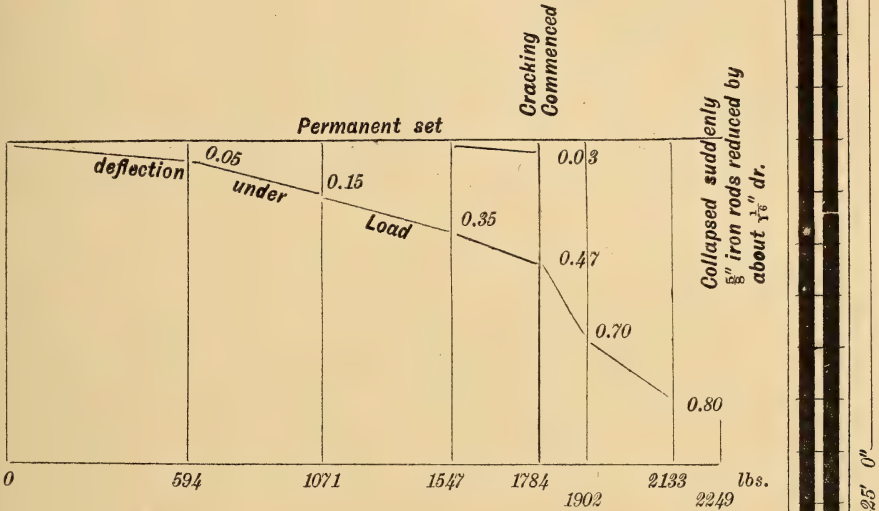


Fig 1. Ferro concrete Beam 6" x 6", reinforcement 2 rods of $\frac{3}{16}$ " dr. round iron, length 12' 0", ends supported at 10' 0" clear span, tested to destruction by a distributed load, 7 days after casting.

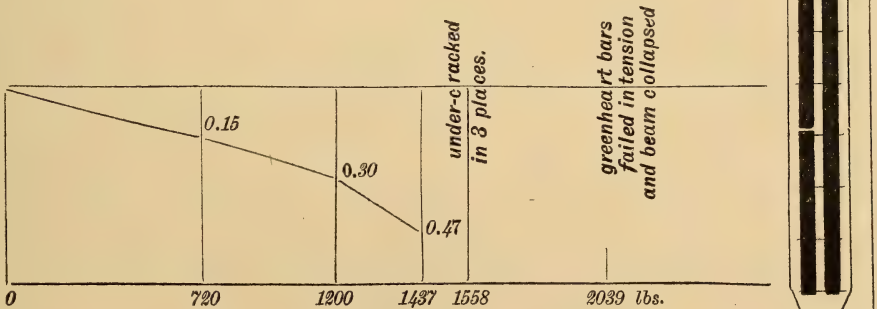


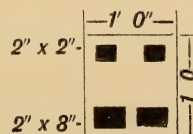
Fig 2. Ligno concrete Beam 6" x 6", reinforcement 1 bar of greenheart 3" x 2" length 12' 0" ends supported at 10' 0" clear span, tested to destruction by a distributed load 16 days after casting.

All deflections in inches.

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14.9.17.



Gross Section of Pile $\frac{1}{4}$ " Scale.

Fig 3.

resistance to tension, taking that of iron at 5 tons per sq. inch and that of greenheart at one-fifth its ordinary ultimate resistance as given in the preceding table becomes $\frac{1}{6.4}$

It is obvious therefore that at present prices a very considerable saving may be effected by employing greenheart reinforcement in lieu of iron or steel, and as soon as the advantages of ligno concrete are more widely known and appreciated the writer anticipates a large market for greenheart reinforcement, while many of our other hardwoods, *e.g.*, Wadara and Mora, will also probably be found suitable for such employment when their resistance to direct tension has been ascertained

A FISHING TRIP ON THE UPPER WATERS OF THE MAZARUNI RIVER.

BY G. E. BODKIN, B.A., F.Z.S., F.E.S.

And an ingenious Spaniard says, that "Rivers and the inhabitants of the watery element were made for wise men to contemplate and fools to pass by without consideration. "And although I will not rank myself in the number of the first, yet give me leave to free myself from the last by offering to you a short contemplation, first of rivers and then of fish."—The Compleat Angler.

Previous to May, 1916, my experience of the possibilities of fishing in British Guiana was confined to the usual week-end lukanani fishing at the Lamaha stop-off. Here lukanani, do not run very large compared with their brethren in the great rivers of the Colony and my successful efforts in catching them have been by trolling which requires a modicum of skill and not even a rod unless one feels like it.

Early in 1916 I had the good fortune to be included in a party on an official visit to the Peters' Mine, Puruni River. A glance at the map will show that such a trip entails a long journey up the Mazaruni River and a shorter one up the Puruni—its tributary. I need hardly add that the Mazaruni abounds in dangerous rapids but in places is noted for its fish and game. Bearing this reputation in mind I took with me a strong rod and reel with a good selection of spoon baits. Owing to the necessary haste with which the journey up river was made only a few chances of using the rod occurred but my several experiences with large lukanani—a few minutes snatched before breakfast, and again before darkness descended—were quite sufficient to whet my appetite for further experiences and I promised myself that by hook or by crook I would pay another visit to this river and under circumstances more conducive to sport.

Luck was with me. In October of the same year the late Mr. S. W. Cole, Warden at Bartica, who I had the pleasure of meeting on a previous occasion, wrote to inform me that he was going up the Mazaruni in November for river-cleaning purposes; the possibilities of enjoying sport were excellent, and he considered it a good opportunity. It did not take me long to decide. I secured a month's leave from the Government, made the necessary arrangements, and left for Bartica on November 19th.

A short description of some of the items of my sporting equipment should perhaps be included here as they will certainly prove of interest to fellow anglers and possibly be of some assistance to them at a later time.

My rod consisted of a cane built, 7 foot 'Victor' casting rod, manufactured by the well-known firm of Hardy Bros., Alnwick, England. In conjunction with this rod I used a Hardy's No. 2 Silex reel holding 60 yards of well dressed silk spinning line of medium weight. A more

admirable combination for this kind of work I cannot imagine. The superb qualities of these three made casting from the reel a positive pleasure and I could drop my bait in any desired spot with a minimum of effort. The traces I used were of fine twisted steel wire made by the same firm and they withstood violent strains without kinking in the slightest and I never lost a fish through any one of them snapping.

The strength and resiliency of the rod were surprising though it underwent some fierce strains. The Indians in our crew were greatly fascinated by this weapon and I often found them making a minute examination of it. They could not grasp the utility of the rubber button at the end of the butt; they were convinced it was a '*beena*' of some kind or other!

I carried a goodly assortment of spoon-baits varying in size from 1 $\frac{3}{4}$ inches up to 2 $\frac{1}{2}$ inches. I found that the gimp line attached to these spoons at the time of purchase was worse than useless as even a small perai seemingly encountered no difficulty in biting clean through it. I therefore removed it and coupled up the spoon direct with the wire trace. I experienced that only a very small lead weight was necessary with these spoons—about $\frac{1}{4}$ of an ounce. According to the advice of my companion I purchased a small tin of vermilion enamel and therewith carefully painted the concave sides of my spoon baits. I can testify to the increased attractiveness of the baits by such a procedure; it is a tip well worth bearing in mind. An assortment of spare treble hooks was also carried. Powerful perai frequently snap off one or two hooks of a triangle with their armoured mouths.

I am afraid this somewhat technical account will tend to bore the reader unversed in matters piscatorial, but it is incumbent on me to give the benefit of my experiences to fellow anglers.

I have forgotten two other indispensable articles of my outfit namely a small bottle of good-quality, thin, lubricating oil, and a plentiful supply of veterinary vaseline. The oil is necessary for the reel and the vaseline is unapproached as a rust-preventer; smeared on thickly it can't be beaten. I also carried a double-barrelled 12 bore shot gun and a good supply of cartridges loaded with BB and No. 5 shot. I found these adequate. Cartridge cases, unless brass, *must* be kept dry, otherwise they speedily swell and refuse to fit the breech of the gun. I found the vaseline extremely handy for keeping rust from the gun.

I think I have now pretty well covered all the various points of my equipment and we can now pass on to the incidents of the trip itself.

You may imagine our departure from Bartica; there were nearly twenty of us all told and every member of the crew had someone to see him off. Of course, the buck ladies turned out in force, most of them accompanied by a bevy of rotund 'picknies.' Most sedate were these people in their farewells. With the exception of a very occasional interchange of remarks in their own tongue a stolid silence was maintained.

Their eyes however missed nothing and every movement was followed and noted. The Bovianders, according to their custom, kept up a ceaseless chattering, and at times a perfect fire of witticisms was maintained between the shore and the boat.

At last we got under way, the stelling with its little crowd soon vanished from view behind the point, the last straggling houses of Bartica were passed, and our journey had commenced !

Our crew was a very fair sample of its kind. Owing to the proximity of the season's end we had a somewhat higher class of men than is usually the case. I believe that at least two of them held captains' certificates and several others bowmen's certificates for this river. Besides these, of course, we had our appointed captain and bowman. There was a fair sprinkling of Acawoi Indians of the more civilized kind—men inured to the hardships of such work and highly skilled in all matters appertaining to the handling of any craft from a wood-skin to a boat of our own size among turbulent waters.

Many travellers in the colony have commented upon the peculiar methods of paddling in unison adopted by such crews. The strokes of the paddles are always in perfect time but there are quite a number of particular variations—little quick movements, flourishes, and raps on the gunwale, rhythmically performed between the strokes which demonstrate absolute control and sure skill. The time and nature of the stroke is apparently regulated by the first pair of paddlers sitting side-by-side in the bow ; the stroke is suddenly altered without any previous warning, and by instinct as it were, the whole crew seem to anticipate the change and act accordingly. The entire performance, although perhaps tending to some waste of energy, is really skilful. Let anyone who doubts take a paddle for himself, change places with one of the crew, and essay to manipulate it ; he will speedily be disillusioned.

On the Mazaruni between Bartica and the first rapids there exist a large number of scattered settlements inhabited by Indians and Bovianders. It was at one of these places that we secured, by previous arrangement, a small bateau which was to be used in the river cleaning where the larger boat could not be utilized. Two of the crew were detailed to man this craft.

We made our first camp at the foot of Tutruba rapids. These cataracts at high tide do not appear at all formidable but when the water is low they are dangerous in the extreme and like most other rapids in this river have in time gone by taken their toll of human life.

The first camp in the bush is not soon forgotten. One has to forget all previous experiences of camping out in other climes. When the weather is dry such resting places are comfortable but when rain is falling the discomforts are manifold. The hammocks are slung between two upright posts driven into the ground for the purpose ; the roof consists

of a tarpaulin drawn over a vertically placed pole between two trees and stretched out to posts on either side. The 'floor' is another tarpaulin on which the necessary camp impedimenta are placed.

"Early to bed and early to rise" is the keynote of such camps; no time is wasted in making or striking camp. Supper is taken at about 6.30 p.m. and most people are asleep by 8.30 p.m. The men are astir at the first suspicion of daylight and further sleep is then impossible. Personally, I rarely sleep well in a hammock and consequently welcome such early rising. I can recall however quite a number of really comfortable and cheerful camps on this particular trip. Occasions when a glorious sunset over the river enhanced the natural beauties thereof, the cooking fires burning bravely and cheerily, a snatch of song from the crew, and the prospects of a good dinner caught by ourselves were all conducive to a happy memory.

I started fishing the following morning just above Tutruba but had little sport beyond a couple of large perai. A large lukanani occasionally turned lazily over in mid stream but quite refused to regard my spoon. Clearing the 'portage' at these rapids occupied the whole of that morning but in the afternoon we moved some distance up stream and camped on a rocky island. This was one of the best and driest camps we experienced during the whole trip. All that evening and on the following day Mr. Cole and myself moved from spot to spot in the small boat trying every likely piece of water. A few perai and a small lukanani were our reward. The weather was hot and bright and the river exceedingly low. The Indians brought in a couple of powis and I was fortunate in shooting an acourie which the captain's dog had been chasing for some time and accidentally drove near the camp.

The perai is a horrible fish to catch. In the first place he disillusions one by seizing the bait with a vigour worthy of a far larger fish, makes one short run and then comes in more or less placidly. He is quite capable, with his formidable teeth, of shearing clean through any tackle softer than twisted steel wire. When safely landed he grunts in a most sinister manner and woe betide any naked foot or finger that comes within grasp of his steel trap jaws; he thinks nothing of taking a toe or finger clean off. The crew always eat the perai we caught, whether vindictively or not, I could not make out. As soon as they were caught the Indians invariably battered the heads to pieces so as to make *quite* sure.

I have two sets of perfectly preserved perai teeth before me as I write. They are very sharp with the edges saw shaped; the teeth of the lower jaw fit accurately into the spaces between those of the upper. This fish is a robber also; many a time when hauling in a small lukanani or one of his own brethren the line suddenly went slack; a perai had removed fully half of the captured fish. I have nothing good to say for this denizen of our rivers.

Our next camp was above the rapids known as Mapituri. It was here that I caught *the* lukanani of the trip. I well remember the evening. It

had been raining slightly all day but held up towards late afternoon and we sallied forth to try our luck once more. I was standing right on the edge of the rapid and casting across the stream when Mr. Cole called out that there was a large one just behind a small rock about 15 yards away. At my second cast I dropped my spoon-bait just to one side of the rock and was reeling in when there was a sudden swirl in the water and something seized my bait and went off with it like an express train. Fully 40 yards of line went out before I could check the rush, then clean out of the water, fiercely shaking his head, jumped the largest lukanani I have ever seen. A series of shorter rushes ensued and the fish sulked beneath our boat which was moored to a rock a short distance off. I sent an Indian to investigate and he succeeded in moving him. Another rush and a leap was made and then he began to tire.

The problem now arose as to landing him. Such a fish certainly would not go into my net and no gaff was to hand. An Indian settled the matter by taking a flying shot at him with a powerful bow and arrow which he had just been using for pacou shooting. He missed and I shouted out to the man to come closer and shoot when I gave the sign. At last I managed to bring the fish within easy shooting distance, the arrow sped true to its mark and thus transfixed, he was hauled ignominiously to shore. This lukanani weighed just over 13 lbs. by my spring balance and a nobler looking fish I have seldom seen with the large 'eye mark' near the tail and his dark ruby-red eyes.

In this same rapid one of the bovianders in our crew secured with his bow and arrow a magnificent pacou which, if anything, was heavier than my lukanani. It is a fascinating spectacle to watch a skilled man killing pacou in this manner. These fish will rush right up into the swiftest water in a rapid, hang there for a few seconds so as to snatch a mouthful of a certain aquatic plant which they dearly love and grows only in such places, then retire only to repeat the performance again and again till replete.

In order to get within range of the fish it is necessary to wade out across the rapid which is a fearsome task for anyone but a skilled river hand. Having gained a likely spot their keen eyes soon detect the presence of a pacou and at the critical moment an arrow is launched from the powerful bow with unerring aim. I should add that this arrow is secured to the wrist by a long cord which, at the time of shooting, is skilfully arranged so that the arrow is not impeded in its flight. It is necessary to get within a few yards of the fish as this is the limit of the attached cord. When once transfixed it is an easy matter to secure the fish.

The pacou is a handsome fish and is shaped much like our English brown bream. His sides are delicately tinged with red. His handsome appearance does not detract from his virtues when cooked. Properly prepared, fresh pacou is something to be remembered.

The following morning we cruised about at some distance from our camp but I had little sport. My companion, however, caught a brace of five pounders and another smaller lukanani in the afternoon.

We spent three nights at this camp while the crew every day were busy clearing tacoubas and other encumbrances from the itabus in the vicinity. Game was plentiful and the Indians brought in daily either a labba or several acouris, so with the fish that we secured we fed royally.

Every evening the captain amused himself by setting a species of night line. The fish he intended to catch, judging by the ponderous tackle he used, must have been enormous. I am sure his line and sinker, composed of a large piece of rock, would have held a bush-cow with ease. He was unsuccessful.

At this period heavy showers of rain fell and the river began to rise accordingly. Such conditions were bad for lukanani fishing though it did not affect the perai who were always with us like the proverbial poor. We gradually made our way up stream catching a few lukanani up to 6 lbs. in weight every here and there. At last we arrived at Caburi where we camped for two nights under very damp circumstances. At this place the waters of the Caburi Creek join the main river and the river itself is broken into a series of highly dangerous cataracts. There is an artificial haul-over and a concrete pier has been constructed to facilitate the landing and unloading or reloading of boats passing either way. When the water in the river is exceptionally low the fishing here is excellent but at the time of our visit the river was decidedly high and "rolling rapidly." In one of the upper pools at the foot of a small rapid Mr. Cole got fast in a really big fish but after a short struggle the hooks came away.

With this exception we had very poor sport here. On one occasion I was fishing from a small rock well out in the stream and had almost recovered my spoon after a long cast when there was a sudden swirl and a plunge just beneath where I was standing. The fish, which was evidently a large one, missed the bait and I saw him no more. The suddenness of the rush, however, almost caused me to lose my footing.

There is always a delightful uncertainty in casting a spoon into these dark waters; there are possibilities of all sorts and sizes of fish.

At Mora rapids, just above Caburi, my companion landed a fine 8 lb. lukanani after a protracted struggle and later in the morning I had the very singular experience of hooking a 6 lb. pacou with a spoon bait. I foul-hooked him on the nose as it were and perhaps this accounted for the desperate rush the fish made. I recollect that I had to plunge into the water almost out of my depth so as to follow him up. His rush ended in a small semi-submerged bush where he sulked and was eventually captured by the bow and arrow method previously described.

Mr. Cole informed me that during a long experience of fish and fishing in the great rivers of the Colony he had only once hooked a pacou with a spoon bait and foul hooked at that. Apparently the pacou

mistake the red colour of the spoon for one of their favourite seeds which float down the river and, being unable to grasp the spoon with such a small mouth, occasionally get foul-hooked.

When the river is low the Indians secure large numbers of this fish by isolating a suitable area of water in a convenient place by encircling it with large stones placed close together and then poisoning the fish thus imprisoned. We encountered such a spot on our journey upstream. Another method, which requires greater skill, is to carefully 'mash' the ripe fruits of a plant not unlike the sapodilla in appearance and which abounds in this river. This bait is then carefully placed in a rough 'buck' basket so constructed that the fish can nibble at the fruit without securing any large quantity. The basket is then suspended just beneath the surface of the water in a likely place and the Indian waits motionless at a short distance off. The odour of the fruit is rapidly carried down stream and speedily attracts any pacou in the vicinity.

By dint of 'following his nose' the fish soon arrives at the basket and after a careful inspection—for the pacou is a most suspicious fish—he commences to feed. At this critical moment the Indian launches an arrow and almost invariably secures his prey. He then awaits the advent of another. A very particular point about this proceeding is that the bait must be handled as little as possible otherwise the pacou will detect the trap and depart.

A similar method is practised by paring the kernels of freshly fallen mora seeds and allowing the particles to fall in the water close to the river bank.

I now come to the most exciting episode of the whole trip. According to our usual custom, while breakfast was being prepared, we chartered the small boat and went some distance up stream to some likely looking rocks for fishing. We were busy casting and I had just recovered my bait from the water and was about to step back from the water's edge when something prompted me to glance over my shoulder. What I saw gave me a rude shock, and I experienced that uncomfortable crawling sensation along the scalp of the head which is usually associated with one's hair 'standing on end.' There, directly behind me, lying in a depression of the rock, was an immense water camoodie!

I hastily retreated some yards and called to my companions. Together we approached the serpent and cautiously surveyed it. Luckily the brute was fast asleep but with a shudder I could imagine the rude awakening and violent surprise of both parties had I stepped backwards.

We quickly despatched a man for the gun and on his arrival Mr. Cole boldly approached, and, having administered a dig with the muzzle of

the gun which caused the reptile to lift its head clear of the coils, gave it the benefit of a full charge of BB shot from a choke, sixteen bore gun through the head at close range. It took all five of us to get that snake into the boat and back to camp. There, by means of ropes, we stretched the corpse between two stout trees and set to work to skin it.

Skinning such a snake is a real job ; it took four of us two hours by my watch and we made a bad job of it then. I had hazy recollections of making a 'ventral incision' and 'peeling the skin off like a glove' but somehow it didn't work. We had to cut the skin away from the flesh—every inch of it. With two exceptions the Indians refused to assist ; they have some myth about such snakes and small children which, after all, perhaps, has some vein of truth in it. Camoodies are not particularly fastidious in their appetites I understand.

A good application of arsenical soap was given and the skin was put out in the sun to dry, on every available occasion. This preparation preserved the skin wonderfully and when finally prepared by Professor Pile in Georgetown it measured just 25 feet in length. The 'inner snake' we 'consigned to the deep' as perai food. Our captain wanted to get some of the fat which he said produced an admirable mixture for rheumatism but we had had enough of snake dissection for one day and proceeded on our way.

About three days above Itaki, while passing up stream, close to the bank, the captain espied another of these reptiles asleep on a log. The boat was gently backed down and from its refuge I manfully shot it through the head. This specimen was skinned the same afternoon and the skin measured just 24 feet. On the following afternoon the captain espied yet another which I also shot, but we had to leave it as the arsenical soap had come to an end and time was getting short. The captain informed me that at certain times of the year such snakes are frequently seen in the river and he began to spin yarns which modestly started at 'about 30 feet, sir !'

After the first snake incident I gave up swimming in the river and performed my ablutions with a couple of buckets of water.

At Itaki I had the good fortune to land a haimara which weighed just 14 lbs. by my spring balance. The fish was lurking in a deep pool at the foot of a small rapid and took my spoon in a most vicious manner. As soon as he felt the hook he leapt clean out of the water and started off down stream at a tremendous speed, taking another small rapid with apparent ease ; I was forced to run along the bank so as to keep up with him. Eventually he came to rest in a large bed of aquatic grass and tangled up the line in a very thorough manner. I thought I had seen the last of him and the position seemed hopeless. One of the Indians came up, however and, wading into the stream, commenced to patiently follow up my line through the tangled growth. He at last located the fish and retired to get his bow and arrow

By careful probing he once more located the exact spot and let drive an arrow which unfortunately missed and caused the haimara to retire even further. The same process was gone through again but this time successfully and the fish was dragged out from his lurking place. He provided an excellent dinner for nearly everyone. The haimara has a mouth and teeth like a bulldog and thinks nothing of taking a mouthful out of an exposed human leg or arm if he gets a chance. The bite is exceedingly poisonous and quite occasionally proves fatal.

Itaki is a beautiful place in many ways and the charm of the scenery alters accordingly to the height of the river. The remains of the old Government Station are extant but greatly overgrown with bush.

Our journey from this point to the Karenang Creek was uneventful except for a tiger scare in our camp at the foot of Tiboku falls. We heard the roars of what must have been a large jaguar intermittently throughout the whole night and we were forced to tie up the dogs in the boat in prospect of a raid by our carnivorous neighbour. Nothing evolved, however, and two Indians which we sent out at daybreak on the off chance of slaying the brute were unsuccessful.

Some little distance up the Karenang Creek we encountered some Acawoi Indians in a woodskin. The occupants consisted of a man and his wife and small daughter. The man was brilliantly decorated with yellow and red stripes which contrasted admirably with his copper coloured skin. The lady was busy making a 'queyu' and in the middle of the craft was a large barrel which spoke for itself. An Indian has only one real use for such barrels and that is to hold 'cassiri.'

We spent two nights in the Karenang Creek with heavy rain falling most of the time. This rain frequently obliterated our view of the Karenang Mountains which are really magnificent and rise fully 4,000 feet and possibly more. Their summit as far as I could judge was bare rock, on the lower slopes there was a thick vegetation. Some beautiful scenery exists hereabouts and the climate was delightful, the early mornings were distinctly cold and a couple of blankets were necessary at night.

From the time we left the Karenang on our homeward journey I think it hardly stopped raining once and the camps were uncomfortable in the extreme. This return journey, as I remember it, was a repetition of driving rain and the boat pushing through rapids which, owing to the swollen state of the river, were now in full swing. Despite this, however, we secured a few fish every here and there. In some of these cataracts a slight mistake by the captain means that the boat is swiftly swamped and the chance of saving one's life in such water is remote in the extreme. Cases have occurred where two or three men have survived by swimming to some isolated island and there undergoing slow starvation, till some other boat chances to pass that way and even then their rescue is a most perilous undertaking.

I shall never forget our last camp. It was on a rocky island just above the last rapids. Next morning when we woke up there was at

THE LUTHERANS OF BERBICE.

BY FRED MAY.

In or about the year 1743, Mr. Lodewyck Abbensetts, the alleged founder of the Lutheran Congregation in Berbice, called together a meeting of the members of the "Unaltered Augsburg Confession of Faith" then residing in that Colony.

At this meeting held on the 15th October, 1743, it was resolved that a petition should be presented to the Directors (*i.e.*, of the Berbice Association) and to the States-General of the Netherlands praying for the free exercise of their religion, and the Rev. Consistory in Holland was requested to select a Minister.

The Consistory, before granting their request, suggested that they should wait until sufficient funds had been raised, and property secured for the support and maintenance of their establishment.

The Court of Policy whilst acceding to their request informed them that they would be expected to pay for the whole cost of their establishment themselves, as well as to contribute to the ordinary Church fund equally and in the same proportion as all other inhabitants. The planters and the Dutch Reformed Church viewed all new religious bodies with suspicion.

Inter alia all persons presenting free coloured children for baptism were required to sign an engagement that these children should never become a charge to the community or to the public.

The Local Authority went so far as to refuse them permission to place their Church (collecting?) Boxes in the taverns for receiving contributions, assigning for reason that, as the Lutheran Community had not to maintain the poor this privilege could only be enjoyed by the Reformed or Established Church, which alone had the administration of the Poor Fund.

At this first meeting in 1743, six members were chosen to act as administrators or vestrymen and this continued until the arrival of their Minister in 1752. He on his arrival drew up a set of regulations which were confirmed, and registered in the Government Secretary's Office. One of the Vestry men was appointed Bookkeeper and he had to render annual accounts of expenditure to the Vestry, another member was appointed Warden and his duties were to keep in repair "in a conscientious manner" "consistent with the state of the funds" the property of the Church. There was also a "Scriba."

In 1763 the only buildings saved from pillage and fire from the then revolting slaves were the properties of this Community at Fort Nassau who placed them at the disposal of the Directors (Court) as a residence for the Governor and a hospital for the sick. In spite of this occupancy which lasted for over eleven years the Court would pay no rent for the use of the buildings.

In 1769 a step long contemplated (since 1753) was taken by petitioning the Court for a grant of 500 acres of land known as De Kleine Maripaan (Augsburg). The Court, however, put such a heavy tax on the acquisition of new land, that the plan of having an estate, had to be abandoned until some time after, when the Community was allowed to pay the tax in ten annual instalments and Mr. Botzer then proceeded to lay out the estate (Augsburg). Their funds being in very low water again, and the Receiver General pressing for acre money, some of the other members, Messrs. J. A. Pool and Co., and Mr. J. Van Nooten, of Amsterdam, advanced the required sum, more slaves were bought and an extension of the cultivation undertaken.

In 1774 their debts were so pressing that security for payments was made by a formal deed.

In the year 1813 differences arose between the members, and the Court was petitioned by some of them to enquire into the management of their funds, depleted by mismanagement, the high death-rate of their Ministers, and the expenses incidental to bringing them from Holland to Berbice.

In 1832 the regulations in force for the guidance of the Community were very stringent to prevent self-interest in the management of its affairs "which shall be observed with great exactness." An account of their transactions was to be submitted to their Community. Power was taken to make alterations in the management of Church properties, and the rules were required to be registered in the Colonial Secretary's Office.

No slave could hold a vote or become a member of their administration. The Sacrament was to be administered twice a year, Ministers were to keep a Register of Baptisms and Marriages.

In 1875 a Commission was appointed to enquire into the affairs of this body in consequence of a petition of one Joseph Hicken and others, under the chairmanship of Mr. Attorney General Haynes Smith. The opposing factions were represented by counsel, and as an outcome of this it was agreed that the Bank (British Guiana, now the Royal Bank of Canada), would not permit any of the capital to be touched, and that it was better to defer legislation. The dissension appears to have arisen out of the improper disposal of funds and the attempt to sell one of the properties.

Matters continued in this unsatisfactory condition until 1888 when a Bill to provide for the administration of the Funds of the Community was passed by the Combined Court.

The Committee appointed by the Court to report heard counsel as representing the Established or Reformed Lutheran Church, and the Evangelical Lutherans as represented by the Attorney General (the Chairman) who represented the Trustees appointed by the Court. Various objections were raised by Dr. Belmonte to the powers given in

section 5 of the Bill. The Attorney General whilst agreeing pointed out that they were only intended to meet extreme cases and after some discussion it was decided to modify the section to meet the wishes of the Community.

Under the amended Bill (Ordinance 7 of 1888) the property is vested in trustees consisting of the two senior elective members of the Court of Policy and of an official member appointed by the Governor, who supervise and control the expenditure of the income by the person or persons entrusted by the Lutheran Community with the management of its affairs in accordance with its rules and regulations. Proper statements of expenditure are to be furnished, and the trustees to have power to suspend payment of the income in any case of mismanaging the fund, until enquiry can be made by the Governor and Court of Policy whose decision is final.

The Attorney General pointed out that the Bill in no way pretended to interfere with the internal management of the Society and only vested in the Trustees the property mentioned in the schedule of the Ordinance for the support of the Church with proper supervision.

The clerk to the Attorney General acts as clerk to the Fund.

One of the Community writing against the passing of the Bill stated that the Lutheran Community had always been considered a private body having acquired property by their own means and without help from the Directors of the Berbice Association—now represented by the Governor and Court of Policy, which property is held in the same right as other private property and with the same powers of free disposition. He stated the Government had recognised this liberty in the management of their Church establishment since 1743.

In 1902 the acting Attorney General (Mr. Davson) in the name of the Trustees of whom he was Chairman, requested that Trustees belonging to the Church might be substituted for the two senior members of the Court, for the reason that the Court was continually changing, and that the members lived out of Berbice and would not be in a position to know the requirements of the Community.

He also requested that power be given to the Trustees to sell movable property and vary investments, with consent of the Court. Finally he asked that power should be given to refer to the Governor as arbitrator in the case of contending parties. He added, however, that he did not as Attorney General consider the last proposal workable. These suggested amendments appear to have been made on the petition of the Rev. Mr. Mittelholzer.

The Petitions Committee of the Court of Policy remarked on the necessity for a revision of the rules, and a clear understanding as to who are at the present true members of the community.

Again in 1914, a further amendment was required not from any internal dissension this time, but from the absence of elasticity in the

Ordinance of 1888 which did not provide for resignations or absences from the Colony or for the case of a Trustee being unable or unwilling to act. It did not, moreover, provide for the case of a senior member of the Court, a statutory Trustee, being unwilling to act on the ground that he did not belong to any branch of the Protestant Church.

To sum up the whole matter the Lutheran Community in Berbice appears from the records of the Government Secretary to have been a mutual benefit society as well as a religious one, for they granted pensions, which I believe are still paid.

From earliest times their existence seems to have been a struggle, disturbed by internal discord, misappropriation of funds (if we can believe the petitioners), High death-rate of their Ministers and the cost of bringing men out, nor do they appear to have been recognised by the Directors of the Berbice Association or the Berbice Court of Policy, judging from the stringent rules laid upon them and absence of any monetary aid. In spite of all there are still a few of them left in the Ancient County yet working and watching for the "promised Minister from their Fatherland."

I might mention that the "Directors" so often mentioned in the files of the Government Secretary's Office were the Committee of Governors of the Berbice Association.

There was a small community of Lutheran in the Colony of Demerary and Essequibo and they were supported by the profits of a Plantation called the "White Swan" about the year 1755 but not very much is known about them and to-day they do not exist.

THE RENAISSANCE *

BY C. MARTIN-SPERRY.

It is quite impossible to define the Renaissance in so many words, because there was nothing definite about it either in time or in action. It was a movement which marked a break in the world's history such as cannot elsewhere be equalled, except perhaps by the appearance of Christianity, and possibly by the rise of Mahomedanism. History cannot be studied in periods because periods have no beginning and no end, and because while one country is passing through one phase, its neighbour is passing through another. It has been said that Modern History deals with the period in which the problems that still occupy us came into conscious recognition, and were dealt with in ways intelligible to us. If this be so, then Modern History dates from the Renaissance. The atmosphere of the centuries before that movement is wholly different from the one in which we live. The frame of mind of the Crusader is utterly unintelligible to us ; it requires a considerable effort of the imagination to picture baronial society in the time of the Wars of the Roses. But from the Renaissance downwards men, customs, ideas, modes of thought all begin to be intelligible. With Shakespeare, Galileo or Elizabeth, we seem to have something in common, but Dante and Roger Bacon seem men made in another mould. No one can afford to disregard the Renaissance: It is the one movement in History that affects not only one or two subjects, but almost every department of human interest. Put shortly, the Renaissance was the revival of learning, the emancipation of the individual from the environment of circumstances, or as one writer describes it: "the intellectual, moral, spiritual and artistic rebirth of Europe, the emancipation of the soul of Western Humanity from the bondage of scholasticism, and of authority in ethics and theology."

The fact cannot be too strongly insisted upon that it was a movement, and therefore no precise dates can be given for its beginning or its end. It was the transition from the Middle Ages to Modern Times, and it is no more possible to say that it dated from one year and ended in another, than to say when boyhood ends and manhood begins ; the two are insensibly merged in each other.

The movement took place practically all over Europe, but of the countries in which it was most evident, Italy comes easily first not only in point of time but in the matter of importance, followed later by France Germany and England. No two people agree as to what may be put down as its earliest appearance in Italy, but we may certainly consider it as having been in full swing by the middle of the 15th century.

The pervading idea is emancipation. Where there has been the restraint of rules, of conventions, of narrow modes of thought, the authority of these is frankly questioned, and is if necessary to be swept

*Lecture to Young Men's Guild, June 20th 1916.

aside by the individual. Individualism is therefore the outcome of this movement towards emancipation. The inevitable result of this liberation from the restraints of tradition and authority was an immediate outburst of intelligence, a rapid development in politics, art, letters, science, adventure and almost every form of human activity. This outburst was so great in its depth and comprehensiveness that it has never been equalled not even by Athens at her zenith.

Though there is a cause for every event in History, it does not follow that the cause is always easy to find ; this is particularly true in the case of a movement so indefinite and so vague as the Renaissance. Five reasons can however be given, any one of which or possibly all of them to a larger or smaller extent, may have been responsible for the movement. They are :

(1) *Inventions.* A number of important inventions were, for some reason or other, made, and while many of them may be looked upon as parts some of them were contributory causes. Such inventions as those of the compass, telescope, gunpowder and printing must of necessity have had a highly stimulating effect, and have paved the way for further developments in science and learning.

(2) *City States.* City States have always been favourable to refinement. One has only to glance at the histories of Athens, Corinth, Milan, Venice, Florence, etc., to be convinced of this fact. Perhaps political independence has a stimulating effect, perhaps it is the fact of self-government which stimulates men and brings out the best qualities that are in them. At this time City States were springing up all over Italy. The country was divided into a number of small territories, each consisting of a city which dominated the country round about, and usually a few other small towns.

(3) *Greek Influence.* In the 15th century the advance of Mahomedanism was threatening Europe. Christendom was divided into the Greek Church of the East and the Latin Church of the West. In view of the progress of Islam, an attempt was made to reconcile the two, and a Council for this purpose was summoned at Florence. The real object was a failure, but advantage was taken of the presence of so many Greek-speaking men of letters to stimulate the taste for the study of Greek language and philosophy, which had been impossible on account of the absence of proper teachers in Italy.

(4) *Fall of Constantinople.* The Turks captured Constantinople in 1453. Constantinople was practically the only city in Europe where culture had survived the middle ages, better known as the Dark Ages. What with the inroads of barbarians, and the long period of strife and warfare, there had been no time for anything so unpractical as the pursuit of art and learning. The glories of the golden age of the Roman Empire which had inherited the civilization of Greece, centred therefore in Constantinople. As the Turks advanced, the men of learning fled westward,

and Italy was the first land they came to in which they could settle. Even more momentous was the fact that the Turks now blocked the highways between Europe and the East, and new trade routes had to be found. Necessity being the mother of invention, Columbus in his attempt to find a new trade route discovered America in 1492, and Vasco da Gama got round the Cape of Good Hope to India some five years later.

(5) *Reaction.* An unprogressive condition of things cannot last forever without producing a revolt, and the mental stagnation of the middle ages could not satisfy the aspirations of men whose minds were now being stimulated by all these causes.

Such then were the opening phases and the immediate causes affecting them. But before being able to appreciate them, it is necessary to understand the condition of Europe in the Middle Ages.

Contrasts are always attractive, and the easiest way to understand the movement now in progress is to look upon the Middle Ages as a period of unrelieved gloom and stagnation, and the Renaissance as the sudden appearance of light and progress. The most striking features of the Middle Ages are four :—(1) Power of the Church. (2) Submissiveness to Authority. (3) Unity of Social and Political Organisation. (4) Absence of Joyousness, Vitality and Vigour.

The power of the mediæval Church was very great, and so long as the Church occupied itself with Religion, and the monks and clergy with good works, they kept within their province and were a tremendous factor for good. In the 11th century the Church was at its greatest, but gradually the monasteries degenerated into a state of selfish lethargy or paid more attention to business and intellectual pursuits than devotion to saintliness and unselfishness. In the higher spheres of the Church, immense spiritual authority brought it into conflict with temporal princes and we see Pope Pius solemnly deposing Queen Elizabeth in his Bull of 1570. In its effort to uphold a good moral standard and to combat heresy, the Church adopted too great a rigidity of rule. Its authority was unquestioned. It discouraged interest in the physical lest the spiritual should suffer ; hence science made no progress because scientific research was not tolerated. Religion and philosophy suffered, because theological criticism was forbidden once the Church had spoken. The study of the human body was forbidden, hence art and the appreciation of beauty were checked. Naturally this produced a reaction. This leads us to the second feature : all must bow to authority, whether of Pope, convention or tradition. Criticism was anathema ; the dislike of anything new, unusual or contrary to past practice, seemed ingrained in the minds of men. Roger Bacon and Galileo were persecuted not so much because their views were disliked, as because such treatment of the authors of novelties was quite in accord with public opinion of that time. Then we have the principle of Unity underlying the social and political organisation. The world was looked upon not as a collection of individual nations, but as one great political society, and was based on the theory of universal monarchy. That God meant the world to be ruled as one great state by His Representative was

universally accepted. The Guelfs or supporters of the Pope quoted the committal of the keys to S. Peter. The Ghibellines or adherents of the Emperor said "render unto Cæsar," while those who sat on the fence quoted the two swords of the Gospel, and maintained that Emperor and Pope were co-equal as God's Representatives. The theory of unity was recognised by all parties. While to-day everyone makes his own place by his own work and powers, in mediæval ages a man was born into a definite place in the social system, and could not rise out of the position in which he was born. His individuality counted for nothing.

And fourthly the Middle Ages are a byword for gloom and unprogressiveness. With a few exceptions such as the attractive manners of chivalry, the adventures of the Crusaders, picturesque legends of heroes and the songs of the Troubadors, the Middle Ages were a period of stagnation and joylessness. Beauty was a snare, and pleasure a sin ; art had no freedom. Authority laid down how sacred pictures were to be painted ; many thought it sinful to represent Christ with natural beauty. The study of the nude was forbidden, and monks disregarding the maxim that cleanliness is next to godliness, boasted that they had not seen their own bodies for years. Art was most melancholy, as anyone can recognise who has been to Italy and seen the pictures of that period. People actually took comfort in the assurance that the end of the world was at hand, and the general spirit of gloom is shown by the "Vision of Piers Plowman" and Dante's "Inferno." This was the state of Europe before the Renaissance which was now to pass away, and to give place to something quite different.

The chief characteristics of the new era were naturally the reverse of those of the Dark Ages, and may be called :—(1) Individualism. (2) Critical Spirit. (3) Aestheticism. (4) Love of the Antique. (5) Inconsistency. Of these perhaps the emergence of the individual is the most important. People began to claim the right to think for themselves and to use their own reason. Convention had to give way before progress and development, and the two most striking types that can be given of this new order of things are Machiavelli's political doctrines and Martin Luther's free-thinking. The same was true of nations, each of which now began to play its own hand, and it was not so long afterwards that Francis I, that Most Christian King, concluded an alliance with the Sultan of Turkey. Such an occurrence would have been impossible before the Renaissance.

And as men began to think for themselves, they gave up taking things for granted, and indulged in free discussion and criticism. Statements of fact and theory were subjected to critical judgment, and their life was short if they did not pass this ordeal.

Aestheticism, the love of beauty in the abstract, was another striking characteristic. The worship of beauty was common to the whole. To be artistic was something which counted even more than to be learned or clear-thinking. Unfortunately, form came to be considered more than meaning, and in all branches of art, grace in the method of expression

counted higher than the depth of the thought expressed. However, this aestheticism produced great power of artistic criticism. From the Pope down to the man in the street every Italian was a judge of art.

Another very important characteristic was love of the Antique ; and the cult of the ancient history of Greece and Rome, at first uncritical and indiscriminating, it ultimately produced the Revival of Learning, and the development known as Humanism.

If we are tempted to think that there were guiding principles on clearly defined lines, we are soon undeceived for inconsistency was a striking feature. Perhaps it was because the old order was changing and the new had not yet settled down. The anomalous position of the Pope was the most striking of all the examples of inconsistency. Serious and religious men denounced him for worldly abuse of power, and were yet willing to kiss his foot as God's Vicar, and to plead for absolution from him who held the keys of Heaven. Sixtus IV. founded the Vatican library and built the chapel which is named after him, and which is to-day one of the glories of the world, and yet broke up the wonderful collection of cameos and medals which his predecessor had brought together. Few men did more than Pope Nicholas V. to beautify the City of Rome ; S. Peter's and the Vatican are standing monuments to his name ; and yet for his new buildings he pulled down ancient Roman temples and used the Coliseum as a quarry. There was indeed nothing so consistent as the inconsistency of the Renaissance.

Now we come to the two great achievements which were the discovery of the World and the discovery of Man. The former meant not only the exploration of the globe, but also scientific discoveries and inventions ; and the latter the discovery of man in political, intellectual and spiritual matters ; each of these should be considered separately.

The main motives for the outburst of exploring energy were the crusading spirit, trade and love of adventure, the last being typical of the burning desire to be free from cramping boundaries. Greek astronomers had known of the spherical shape of the earth, but apparently through overestimating the breadth of Europe and Asia, the idea was to seek the east by sailing west. The idea died out and was neglected. But as we have already seen, the fall of Constantinople brought about the need of finding new routes for the acquisition of trade and still more for the spread of Christianity. It must be remembered that the crusading spirit was a very real one, and all sorts of religious orders were founded for spreading the Gospel in distant lands. But what practically drew explorers eastward was the belief that somewhere in the centre of Asia was a big Christian kingdom, which, if joined up with European Christendom, might be a powerful ally to attack the Moslem in the rear, and the wildest legends had grown up round the name of the great Christian Khan, the semi-mythical Prester John. The position of his kingdom was constantly changing as travellers found that various supposed sites of it were quite destitute of all traces of this marvellous king. A letter had appeared some

time before, supposed to have been written by Prester John himself, Prester being only another name for Presbyter, of which the following extract, tho' a diversion from the subject, is useful as showing how far mediæval imagination could go:—"Our land is the home of elephants, "dromedaries, camels, crocodiles, wild asses, white and red lions, white "bears, white merles, crickets, griffins, tigers, hyaenas, wild horses, wild "oxen and wild men, one-eyed, with eyes before and behind, centaurs, "fauns, satyrs, pygmies, forty-ell-high giants, cyclopes and similar women." The whole district apparently teemed with the miracles of nature. for it continues:—"In our territory is a certain waterless sea of "tumbling billows of sand never at rest. None has crossed this sea; it "lacks water altogether, yet fish are cast up upon the beach of various "kinds, very tasty and quite unique." Among the unexpected inhabitants of the country, one finds Salamanders, Amazons, Gog and Magog, to say nothing of the ten tribes of Israel. Incidentally Prester John enumerates the members of his suite, which is very distinguished:—"Seven kings wait upon us monthly in turn, with 62 dukes, 256 counts "and marquises and 12 archbishops sit at table on our right, and 20 "bishops on our left, besides the patriarch of St. Thomas, the Sarmatian "Protopope and the Archpope of Susa." As the supposed writer was a Christian priest, it would be more charitable to his reputation to assume that Prester John was not its author.

It has rightly been said that the capture of Constantinople by the Turks was one of the most momentous events in the world's history. New routes must be found, or the Indo-European trade would be forever ruined. There were two alternatives: to sail down the west coast of Africa to its southernmost point, if there were one, then east across the Indian Ocean to the coasts of Asia, and secondly to sail due west from the Mediterranean and trust to luck until the east was found again.

Portuguese sailors had been exploring the west coast of Africa and had actually rounded the Cape, which they called the Cape of Torment, and reached the Great Fish River, but the most important voyage was made by Vasco da Gama who got to Durban, and christened his anchorage Port Natal, because he arrived there on Christmas Day, and on May 20th, he arrived at Calicut in India, about 10 months after leaving Lisbon. Further developments were then made by Almeida and Albuquerque, and to shew how all this was regarded as so many souls added to the Christian faith, elaborate celebrations took place in Rome, where valuable spoils from the East were displayed, including an elephant of huge size, which did obeisance three times on its knees before Leo X, after which the Holy Father addressed it in a congratulatory oration of unimpeachable Latin.

This discovery meant a new sea-borne trade for Portugal, and abolished the endless series of trading stations and the disadvantages of combined sea and overland routes. Some twenty ships sailed annually, and the profit on the money spent on ships and voyages has been calculated at nearly 4,000 per cent. Another result was that trade acquisition

led to a policy of conquests, the movement to westernize Asia, and to assimilate Oriental habits of life to those of the West. This attempt still continues today, and it is yet to be proved whether the East will allow itself to be assimilated by the West.

Turning now to the Atlantic route, Toscanelli of Florence was the first to revive the idea of seeking the east by sailing west, but by over-estimating the breadth of Asia, he brought its eastern shore to where the western coast of America really is. For many years tradition had believed that somewhere west of the Pillars of Hercules was a land of mystery, perhaps the fabled Garden of the Hesperides, or perhaps the great continent Atlantis which Plato told of. It was known by many names. Men from Iceland called it Vineland; others called it Antilha, from which the modern name of Antilles is derived: some early maps have it as an island off the west coast of Ireland marked Brazil. The chart of Toscanelli, though incorrect, fell into the hands of a man of great determination, Christopher Columbus, who set sail in 1492. Seeking Asia, he found America. He was greatly upset, and hoped that he had made a mistake, as his idea was to find an open way to India. He returned again and discovered more of America. He died a disappointed man, and the great continent was named after a less famous person—Amerigo Vespucci. The final step was taken in 1522 by Magellan, who sailed through the straits named after him, crossed the Pacific and rounded the Cape, the name of which he changed to Good Hope, and so back to Spain.

It can readily be understood that the results of this world-wide discovery were themselves of world-wide importance, and it would be impossible to mention them all. Their immediate effect can, however, be seen on politics, religion and thought. Politically the Emperor and the Pope claimed authority over the inhabited world, but things got rather complicated when a huge continent was discovered to exist and to be inhabited, which neither Emperor nor Pope had ever heard of. The discovery of America may therefore be looked upon as having tended towards shattering the power of both Emperor and Pope, and to have given rise to the coming system of nationalities. The centre of political gravity was shifted from the Mediterranean to the Atlantic, and the Powers which were to monopolize international politics were those which faced westwards—Spain, France and England. The Church had always claimed the position of universal teacher, and had banned progress and investigation in natural science with the result that when the New World was discovered and the globe circumnavigated, a reaction set in against the Church—and then unorthodoxy found a haven of refuge in emigration.

The incentive to thought of this discovery was enormous and three at any rate of the greatest writers were directly inspired by it. Sir Thomas More, whose "*Utopia*," written in 1516, pictured an ideal state of society in an imaginary island; Montaigne who sang of the simple life of the American savage; and Francis Bacon, who has been called the "Founder of modern physical geography." In politics, religion and thought, the future

of the world was entirely remodelled by the discovery of America, and we cannot leave it without enumerating the discoveries and inventions which represent the scientific progress of the Renaissance. Roger Bacon, already mentioned, claims a place as an innovator in science by his mathematical and chemical researches, knowledge of optics and gunpowder, which revolutionised the art of warfare, making of spectacles; but above all in his understanding of the telescope, he was a pioneer of modern times. Copernicus was another product of the Renaissance. He shattered Ptolemy's theory of the Universe, which made the earth the fixed centre, with sun, moon and stars revolving round it, and laid it down that the earth was merely a unit in a number of worlds revolving round the sun. Galileo followed Copernicus and elaborated his theories, for which he was imprisoned by the Inquisition. He improved the telescope and used it for astronomical purposes. Later on came William Harvey, who discovered the circulation of the blood, and revolutionised pathology.

Most important of all perhaps was the discovery of printing which made it possible to perpetuate the ideas and discoveries of all writers in a way which could not be done before. Teaching was greatly facilitated, as a lecturer need no longer dictate the text, and the Bible was brought within the reach of all but the poorest. And in all of these inventions the spirit of the time was clearly manifested.

It was said that one of the greatest achievements was the discovery of Man. The emancipation which this movement brought about affected not only individuals but also States. The principles of Feudalism were broken down, and in place of an Empire claiming universal allegiance, there grew up the sentiment of nationality. The three great nations which began to dominate Europe were France, Spain and England. France, which had been a conglomeration of great Feudal States over which the authority of the King was nominal, was gradually consolidated by war and diplomacy, and was finally nationalised by the elaborate policy of Richelieu. Spain, which consisted of two independent States was nationalised by the marriage of Ferdinand of Aragon to Isabella of Castile and the subsequent expulsion of the Moors; England emerged from the Wars of the Roses to be nationalised by the House of Tudor under Henry VII, and the depth of this idea of nationality may be gauged by the splendid behaviour of the people, Roman Catholics included, when they had to face the Spanish Armada.

The appearance of distinct nationalities opened up new vistas in international relations. Instead of the dull, straightforward policy of peace with one Power and war with another, bluff, deception and elaborate calculations began to play a part. The theory of the balance of power arose, and the game grew more and more scientific. The creator of this cold and calculating science of statecraft was perhaps the most typical and the most interesting child of the Renaissance, Niccolò Machiavelli, whose theory was to separate from ethics the pursuit of politics as a science and government as an art. "The Ambassador was the man who was sent abroad to lie for the good of his country." Statesmen had to consider statecraft

only, which was not to be governed by rules of morality. To illustrate his meaning as clearly, as possible, he chose Cesare Borgia as his Ideal Prince, the height of cynicism when we remember that Borgia was one of the most unscrupulous scoundrels the world has ever seen.

But the discovery of man was most evident in the great revival of learning which spread over the world. Barbarian invasions of the dark ages had broken Italy's literary traditions, and the ascetic religion of the Middle Ages was inimical to the revival of classical literature. The Church was out of sympathy with what it called the work of pagans, which told of heathen myths, encouraged interest in romance, beauty of form and secular subjects. And although the Church did much valuable work in scholastic theology and law, the classics were deliberately neglected and the result was an incredible depth of ignorance. Greek and Hebrew were practically unknown in the West, and even Latin had degenerated into a very debased dialect. But the intellectual activity and stimulating influence of the Renaissance altered all this, and the revival of learning meant the free and unfettered study of all that appealed to men, the assimilation of the literary beauties of all the classical writers, and in particular the study of Greek with its thought and culture. Such study was known as "*literæ humaniores*" and those who followed it came to be known as Humanists, and the home of Humanism was Italy, and its three great aims were to master the Greek language, to enter into the life and thought of the civilization of ancient Greece and Rome, and lastly to be able to write as well as the best authors of classical times. A moment's thought will show that to attain these three aims, moderation was necessary—exaggeration in any form would make the movement ridiculous. It is unfortunate that in its later stages, Humanism did degenerate into exaggeration, and the first aim led to a craze for collecting anything old, the second was responsible for much affectation, such as the assumption of ancient Roman titles and names, and the third produced imbecilities of speech in an age known as "the golden age of speechification." To give you one instance, a learned Humanist thought it fit to show his powers of rhetoric in starting his address to a learned society by apostrophising the president's nose: "O perfect nose, imperial nose, divine nose, nose to be blessed among all noses."

The scholarship of the Italian Renaissance may be divided into three periods: (1) the age of passionate desire when men like Petrarch and Boccaccio stimulated in others the desire for knowledge; (2) the age of collecting and formation of libraries; (3) the age of criticism and foundation of Academies. In the first period the classical authors were not well known; many of them had not yet been discovered, and the Greek authors were known only in Latin translations. The movement therefore depended mainly on individuals who knew Greek and could be persuaded to come and teach it. Petrarch has been called "the Father of Humanism." He was the first great man who attempted to learn the Greek language and to encourage others to follow him. The foundation stone was laid by Chrysoloras who came from Constantinople on a mission

to Florence. The Florentines seized the opportunity and gave him an appointment at the University. The whole of educated Florence listened to him. He produced the first Greek grammar, which was the one used by Erasmus when teaching at Cambridge. The second period was started in a small way by Petrarch and Boccaccio; manuscripts were mostly found in monasteries, and once a few discoveries had been made, the fascination of it seized princes and scholars alike. Great families like the Medici employed agents all over Europe to help in the search. The two most famous libraries were those at Florence and Rome. Niccolò de Niccoli had formed a magnificent collection of 800 manuscripts. These he bequeathed to Cosimo de Medici and other Trustees, and they formed the nucleus of the present world-famous Laurentian Library. In Rome the Papal Library was re-organised by Nicholas V, and increased by Sixtus IV, who appointed the Humanist Platina as Librarian, and he it was who catalogued it, and arranged it in its present building. The Church wisely recognised that the new learning had come to stay, and the Papacy, seeking temporal power, took up the patronage of letters. Nicholas V, by temperament a *littérateur*, seriously set before himself the collection of a library and the employment of Humanists on a complete set of Latin translation of Greek authors. Leo X. was a typical Humanist and belonged to the period of the zenith of the Renaissance, and devoted himself to the promotion of intellectual progress and real learning.

In the third period, the age of criticism, the Renaissance reached its high-water mark in literary scholarship. There was now no longer the indiscriminating admiration of the antique. Its place was taken by the systematic study of what had been collected, and this was chiefly done by literary groups called Academies, which met for the study and discussion of learned questions; the four most important of them being those at Rome, Florence, Naples and Venice. The Roman Academy was predominantly antiquarian, and was founded about 1460 by Piero, who preferred to call himself with classical affectation Pomponius. The Academy undertook the study of Roman Archæology. The members adopted an anti-papal attitude and were imprisoned by Paul II, who subsequently dissolved the Academy. It was revived by Sixtus IV, was brilliant under Leo X, and died a natural death about 1530. The Neapolitan Academy was the least important of the four. They studied the Latin language especially and acquired a complete mastery of its style. After a time its character changed and it degenerated. The Florentine Academy was the most brilliant of all, and flourished under the patronage of the Medici; and under the protection of Lorenzo the Magnificent, perhaps the greatest patron of arts of the period, it pursued a really brilliant career. Plato was its patron saint and philosophy was thus its main feature. The Academy was suppressed in 1522, but was subsequently revived when its interests became rather Italian than Platonic. The Venetian Academy differed from the others in being mainly engaged in editing and printing the Greek classics. It was founded in 1500 by Aldus Manutius who supervised distinguished Humanists in selecting, collating and printing

Aldus died in 1515, having printed all the greater Greek classics and some of the Latin with critically edited texts. Shortly after his death the study of Greek began to decline in Italy, and it is therefore to him that we owe the security of the great Greek authors from destruction.

Teaching thus became an important function of the Humanist and it is not easy to exaggerate the influence of Italian students, the aim of the true Humanist educator being to secure the harmonious development of mind, body and character. The movement was a great one, and produced great permanent results. The debt owed to its leaders for the restoration of the classics is incalculable and from that time a model was set before man, which has affected modern literature, and added to the wealth of modern languages. Learning was popularised and made broader and deeper, and a liberal form of education was founded. It is quite impossible in a limited time to trace the Renaissance through all the countries of Europe, but even a short sketch would not be complete without some mention of those countries outside of Italy, which were deeply influenced by it. But before turning to those countries however, one man must be named whose cosmopolitanism prevented his being regarded as belonging to any one nation : Erasmus, born at Rotterdam, living successively at Oxford, Paris, in Italy and Cambridge, and dying at Bâle. To him Humanism was a means for the propagation of truth. The literary conceits and striving after effects and form, which marred Italian Humanism, seemed to him a shallow thing. He was a brilliant writer of Latin and could not tolerate unsound scholarship and uncritical history. In his biblical criticism, he was fearless and independent. He published the first Greek Testament in 1516, and its dedication was accepted by Leo X. To educate men up to sound learning and honest argument was the object of his life. A *persona grata* wherever he went, he did more than anyone else to spread the best influences through modern countries.

In Spain and Holland few great Humanists were produced. The opposition of the Jesuits and the rigour of the Inquisition prevented Humanism getting a hold in Spain. In the Netherlands, several scholars appeared, the best known of whom were Heinsius and Hugo Grotius, the author of the first treatise on international law, whose name is of particular interest to us here in the form of De Groot. But constant religious struggles and the prolonged revolt against Spain left little time for the humane studies.

In France the effect was rather to assimilate than to imitate and revive the thought of the ancients. It produced a new development in national art and literature rather than a reproduction of that of the Greeks and Romans. The revival of learning however influenced her deeply, and gave a great stimulus to art and letters, and in its native literature France is quite distinguished.

In England the new learning took longer than elsewhere to get a hold, and for some time it was considered necessary to go personally to Italy in order to learn Greek. Though England had many distinguished

Humanists, she never produced quite a first-class scholar, and English books were not considered sufficiently important to be reproduced abroad. She had no great patrons as in other countries—Duke Humphrey of Gloucester, Henry V.'s brother, was the nearest approach to one—and no great progress was made until action was taken by the Universities. After this it was spread by schools, St. Paul's founded by Colet in 1512 leading the way. The four greatest English Humanists were Grocyn, Linacre, Colet and More. Grocyn studied under Politian in Italy, and on his return stimulated the new learning by his lectures at Oxford. Linacre taught at Oxford, but is better known for his work in medicine, and for his efforts to banish quackery. To show what he had to contend with, the following is a typical prescription of the times:—"a sow-pig of nine days old, flayed and quartered, and stewed with peppermint, fennel, liverwort, turnip, celery, nine dates and some raisins, to be set in the sun for nine days, and drunk at intervals, nine spoonfuls at a time." An alternative to this was:—"a hedgehog, quartered and distilled with a quart of red wine, a pint of rose-water, a quart of sugar, cinnamon and raisins, one date and twelve turnips. From this sort of thing Linacre tried to rescue the science of medicine, and the permanent memorial of his efforts is to-day the Royal College of Physicians, of which he was the first President. John Colet, Dean of St. Paul's, was a great educationist and though not a great scholar, his work was invaluable in preaching the gospel of a return to the classical ages and the doctrines of the Primitive Church. Last of all comes Sir Thomas More, who represented the highest perfection of character among men of the time. His nobility of character, the example of his domestic life, and the depth of his unaffected religion made his personality a vital factor in the life of England.

To most of us, however, the first idea called up by the mention of the word Renaissance is the glory of the works of art of the period, and though perhaps not the most important aspect, it is certainly the most dazzling and brilliant. But it forms a study in itself and cannot adequately be approached in a short sketch. We must therefore content ourselves with the bare mention of a few of the greatest artists in a period of giants, in which were produced many of the greatest artistic treasures of the world. In painting Botticelli, Titian, Tintoretto, Leonardo, Raphael and Michelangelo for beauty, perfection of execution, idealism and classical inspiration take place among the greatest artists of the world. Architecture was not one of the principal products. Its greatest achievement was the adaptation of ancient models to modern needs. Brunelleschi's dome at Florence, and Michelangelo's at St. Peter's in Rome are among the finest examples. One lesson architecture learnt, and that was precision of form and magnificent proportions, to be seen in St. Paul's Cathedral and in some of the châteaux in France. In sculpture, it is impossible to overlook Michelangelo and Donatello, whose works were so greatly influenced by Greek art.

So far as the Renaissance can be said to have any end at all, it ended in decadence. The impulse continued, but its products became perversions of those which the movement had inspired at its zenith.

But it bequeathed to the world good and permanent results. It was the transition from the Dark Ages to modern times, and the thought, and civilization of the present day are its offspring. We do not now live among giants, but our world is a different one to-day on account of the great wave of stimulus, enthusiasm and freedom which passed over it, and bestowed on it the power of further development. The principles may be capable of further development and modification but they are not likely to pass away altogether.

SOME STRAY THOUGHTS ON OUR PEOPLE.

BY EDGAR BECKETT.

More and more every year is it becoming a fact that, the future agricultural prosperity of the Colony, must lie in a great degree with our peasant class.

Now that East Indian immigration is practically a feature of the past, it is obvious that only such companies which possess the most up-to-date factories and which are ready to successfully solve the peculiar difficulties which present themselves to those who would substitute mechanical devices in place of our primitive methods of culture, can compete with other sugar-producing countries.

There is every truth in Hortensio's remark—"There's small choice in rotten apples."

We have no choice in the matter, the small factories will have to go, we have to depend upon modern factories with every up-to-date appliance for both field and manufacturing processes.

And here the peasant can play his part.

There is enormous scope for cane-farming in practically all the villages contiguous to the sugar estates, and in addition to cane-growing there need be no difficulty whereby a modern sugar factory might not contain also room for the manufacture of calcium citrate, concentrated lime juice, the preparation of rice, copra, coffee, cacao and other products.

In short a central factory not only for sugar but for other products is by no means a visionary project. Indeed we see no reason why the manufacture of flour from plantains, yams, cassava, rice, etc., should not all fall to the lot of what is now known locally as "The Buildings."

The many opportunities and conveniences afforded by a large sugar factory, operate successfully towards extensions in various directions at a far cheaper cost than if separate factories have to be erected.

If it were the case that the central sugar factory became the manufacturing centre of the district, we are convinced that, granted the proper treatment of the farming class, a tremendous impetus would be given to agricultural work in this Colony.

We may pretend as much as we like, but we know that deep in their hearts the majority of our people look upon farming as a last resource, and even those who are making money out of the land take very good pains to train the tastes of their children away from such a vocation. The ambition of all is to become a lawyer, a clergyman, a schoolmaster, or at the worst a clerk or a "counter-jumper." This last named class is

very much on the increase, and if one should take a census of the number in the class of *Titmouse*, one would be astonished at the result.

In a previous article on the Black Peasant Proprietor the writer has not hidden the fact that, in his opinion, the faults underlying these peculiarities belong to us who are responsible for the training of our people. This disinclination or bending away from, work on the land is also found in some instances in the creole East Indian—the product of our primary schools.

The remedy lies, we feel convinced, in taking the “educational coach and turning it in a direction opposite to that in which it is now travelling.” If our children were trained to think correctly we should find less pains given to the things that do not matter and more care given to the weightier affairs of this life.

It is a fact admitted even by the teachers themselves, that many of our children have no respect for anyone, we ourselves are familiar with the as-good-as-anyone-else air that is commonly adopted, the ready lie, the rude retort, the cool insolence, the disposition to take up always an offensive defensive; the ill-brooking of discipline, the want of restraint, whilst as to their morals (using the word in its narrow restricted sense) the condition of some of our young people tells its own sad story.

The tragedy of it all is that we appear to know these things in our hearts and yet no drastic remedies are sought for, the outer covering of respectability is allowed to cloak a state of affairs as unsatisfactory as it is unsavoury.

How often do we find out here the well-kept home, the restraint of keeping within the income earned, the regular methodical habits that spell success, the sinking of self and the practice of doing what is right because it is right? Are our clergy satisfied? Are they pleased with their efforts?

The ill-kept grave-yards, the dirty churches which one finds here and there, would point to the fact that the *laissez-faire* habit has not escaped some of our preachers of the Gospel of Christ. Do many of our clergy pretend to know the causes that have led up, step by step, day by day, to the development of the wife beater?

Take our daily papers and read there the list of petty offences; the filthy tongue, the godless conduct, or worse still visit the court-rooms and hear for oneself what our magistrates have to listen to day after day—the sordid stories of petty spite, the abominable lying—are they not all present?

And yet nearly all of these people have been baptised, many have been confirmed, some visit the Altar of God at the Holy Eucharistic service.

Practically all of them have passed through our primary schools. And yet we are told by Ruskin that “Education does not mean teaching people to know what they do not know. It means teaching them to behave as they do not behave.”

Speaking in public on one occasion Charles Dickens said "Mere reading and writing is not education, it would be quite as reasonable to call bricks and mortar architecture."

And so we have it: the ill-conditioned home, too often the scene of senseless rows, generally a mass of confusion, no gentleness, no refinement, little honesty, often enough a number of people herded together that makes even simple decency impossible. No kitchen—a savage scramble for meals, ill-prepared, and worse yet, no bathrooms.

In New Amsterdam recently the writer noticed that a man was put before the Magistrate for wasting the Corporation's water by bathing under one of the standpipes. And yet, mark you, there is not a single public bathhouse in the whole of the town, and the ordinary rooms occupied by the majority of the people do not possess anything even pretending to be a bathroom. Our people are wonderfully clean when one considers the grave difficulty presented in getting an ordinary daily wash

From the home to the school—what sympathy do they get at school? Often the tiny mites are dazed with want of good food, the ready lash makes them still more dazed; a monotonous gramophone method of shrill sing-song that is enough to prevent the smartest man from concentrating correctly the brains his God has given him. There is no such thing practised as games, the physical condition of the children is a matter of no importance at all.

Look at one of our large primary schools pouring out its children, watch their behaviour, note their language and gestures, observe the disgusting bullying, see their ideas of fair play, look at their efforts at so-called games. All confusion, and disorderly rabble, a disgrace to the teachers and still more to the school-manager.

Can the Church dare to pride itself on its schools?

Is the Church satisfied with her progress?

Are we building up men? Do we know anything about the affections and temper of our young men and women, our boys and girls? Do we know how this balata-bleeder, that young clerk, that sturdy young porter treats his wife, his mother? Are his relations with his neighbours what you would expect in a young and healthy man? Is there any attempt at fashioning what Locke called a "whole, sound, round-about man?"

We know right well that we are making a mess of things, though we may not confess it even to ourselves.

Ask those whose opinion is worth having what the rising generation gives promise of, and see if the answer is such as to leave us satisfied with the progress we are making.

And then when things go wrong, this life is a failure, this man acts dishonestly and scurvy acts are seen on every side, we are quick to hear the comment "Our people are no good, they are dissolute, worthless." Are they?

If they are, which of us is striving tooth and nail to introduce a new order of things? How many of our ladies take an interest in the lives and homes of our people; who cares whether the children have a playing ground attached to the school, and decent sturdy English cricket and football is played there, and played in the right spirit? Very few. We can assure those who waste afternoon after afternoon in playing Bridge that a giant's work is waiting to be done at their very doors, and work too of far greater interest than they might imagine.

We do not refer to namby-pamby district visiting, but to efforts which might be made to introduce material reforms in house-building for the poorer classes, the building up of home influence, the arousing of interest in matters that count in the lives of young men and women, the creation of a straightforward, truthful, honest and upright class of people amongst us.

" Find out men's wants and will,
And meet them there. All worldly joys go less
To the one joy of doing kindnesses " sung Herbert.

The writer goes among the people and can claim to know something of the cosmopolitan class (we must remember that even our black population is descended from various tribes of West Africa) that go to make up this colony, or he would sound a note of warning with respect to the future to be played by the masses.

"Pouvoir sans savoir est fort dangereux."

"It is not well to teach our democracy to read unless we also teach it to think" to quote Sir Richard Jebb.

The spiritual portion of their duties attract our priests and doubtless none of these duties is neglected. What we want to see practised is a greater interest in the material life of our people, and it is this interest that we stoutly maintain is almost all together lacking.

There are, we are well aware, many exceptions, but the truth is the material condition of our people appeals very little to our clergy and to those others who are responsible for their welfare and their future well-being in this world.

We believe that if we hope to do anything with our children whether they be Black, East Indian, Chinese, Portuguese or Assyrian, we must see to it that provision is made for decent playing grounds where proper manly games may be indulged in.

The number of petty schools of various denominations we should like to see not only decreased as has lately been the case, but the drastic

closing down of numbers of others and established in their place central schools under Government control, with the very best of masters imported at excellent salaries in charge of these, with a staff of highly-paid well qualified assistants, if necessary as in the case of the Headmasters brought out specially for their known powers of teaching and their interest in educational matters. After the war such men should be available. Men who would know how to build up sound character, who would recognise the great importance of physical fitness and the necessity for training not only the mind but the hand.

Distinction between the training of our children living on the higher reaches of our rivers and children in Georgetown, or some of the large villages, should we think be made.

The old schoolmasters of the Renaissance went on the principle that nothing else but Latin and Greek were of importance, and some of us seem to think that arithmetic and writing and reading must occupy the minds of primary pupils to the exclusion of nearly everything else. The idea that there are lessons for the child in the play-ground and in the field appears to be unknown to the average primary schoolmaster here. Rousseau's well-known aphorism has long ago been recognised by masters of public schools "*les leçons que les écoliers prennent entre eux dans la cour du collège leur saut cent fois plus utiles que tout ce qu'en leur dira jamais dans la classe,*" he says in his *Emile*.

Our Aboriginal Indian children are fast losing their skill in basket-making and hammock weaving—indeed on the Berbice River I was told that the Indians were buying matapies—the chain-like basket sieve used for pressing out the poisonous juices of the cassava before it is made into bread—from the Blacks, and hammocks from the stores in town.

What have we given them in exchange for their lost arts? A little reading, a little arithmetic, a little writing—just about enough to make them exercise a certain amount of cunning. To our mind there is something pathetic in the picture of these little children of the forest repeating the monotonous "sing-song" so common to our primary schools, at the bidding of a young schoolmaster trained in one of our towns.

All these children have to make their living in the forests and by means of the forest products they are skilful enough to bring to their service—are we satisfied that we are helping them in their childhood to fight the battle of life which awaits them in the forest?

Sugar is our staple product, but we are fairly well convinced that if we were to ask a number of our town school-children anything about the growing of the sugar cane and its manufacture into yellow crystals, that their ignorance of the subject would be surprising. We see no reason why models of sugar factories, and not only sugar factories, but citrate of lime factories and mills for oil producing plants, could not find their way into the larger schools. With centralization we believe this would be quite practical.

The objection raised to large central schools under Government control is, of course, the fact that the present system allows of the religious instruction of the children by the school manager.

The squabbles we read of between Managers and Masters are not always particularly edifying and in some instances reflect little credit on either the Master or the Parson, and with respect to religious instruction it is doubtful whether very much attention is paid to this when the Headmaster has the serious business of earning money grants—since the pernicious system of payment by results still continues—out of the little children (God help them!) who are to be trained up by him and sent forth equipped to face life.

The writer has been told by one who had an early training, consisting of two years in one of the best and largest of our primary schools, before passing on to Queen's College, that during that time he received absolutely no religious training at all, had never seen a Bible nor was any attempt made to refer to sacred matters. Yet we are told that the schools must be under the control of the churches in the spiritual interest of the children!

The spiritual interest can well be attended to in the Sunday School class where numbers of children go without fail every Sunday—it is part of the day's outing.

Under good, clean, healthy teachers during the week, with indulgence in manly games calling for the exercise of self-control, we believe that our children would give us hope for the future.

The Parsons have an enormous amount of work to see that the home-life is improved—“*point de mère point d'enfant*” says Rousseau. With regard to the father, we fear little interest is taken by him in the training of his children—in many instances he is away in the balata-fields the greater part of every year.

With the teacher who thinks of nothing but the Inspector's examination once every year, on which his bread depends, with the home life as it is—are we satisfied that we are doing our duty by the children?

The same Inspector's examination would be amusing if the issues at stake were not so great—a visit about once a year and an examination of a few hours and he is able to tell us what the children have learnt!

Have we ever paused to consider that our Assistant Teachers with salaries of something like \$5 a month, must be living on the energies of their parents? Probably they are being supported by a poor hard-working woman over the wash tub, who naturally enough likes to see her son looking smart in high collar, tie and shining boots and thinks probably that he is a “teacher.” From a boy who can live on his mother's hard earned wages, may we expect anything much, and must such a boy in time be leading our children in the path of duty?

Old Pestalozzi's words still apply to us though spoken over a century ago. "If we desire to aid the poor man," he says, "the very lowest among the people, this can be done in one way only, that is by changing his schools into true places of education, in which the moral, intellectual, and physical powers which God has put into our Nature may be drawn out, so that the man may be enabled to live a life such as a man should live, contented in himself and satisfying other people. Thus and only thus does the man, whom in God's wide world nobody helps and nobody can help, learn to help himself."

THE "TIMEHRI" ARTICLES UPON INDIAN LANGUAGES.

BY REV. W. G. WHITE, F.R.G.S.

The War Volume of June, 1917, contained three articles dealing with Indian languages, and Makuchi in particular. An article, in the nature of explanations, may serve a useful purpose.

The remarks in the *Guiana Diocesan Magazine*, to which Rev. Mr. Williams refers in one of these articles were not meant to be "scornful," nor were they, as some might think, aimed at him. I wrote from a wider experience than that of my work in Guiana. I have met such travellers who collected words through an interpreter and wrote about the languages and were regarded as authorities on that language. In my writings for the Census Report of Burma, and in my "Introduction to the Mawken language" (taken up by the Government) I exposed such error. Guiana has furnished similar instances, with which there is no call for me to deal with now.

While it is true that Brett had a working knowledge of Indian languages, I know, from an examination of some of his work, that he was not equipped, by previous training, for scientific language study. The mere number of his publications is no guarantee of his accuracy. Idioms are traps for the unwary, and Brett fell into some of these traps. Brett gives himself away when he allows the spelling *Acawoio* to appear. He did not get even the name of this tribe correctly. His Marriage Service needs serious attention. His Lord's Prayer presents wrong ideas to the Indians who learn it. The Diocesan authorities ought to take up this matter, for the system of conducting the Bartica Mission has been, and is, hopeless, for sound work amongst the Indians. The Indian work should be separated from the English work; and it should include the upper reaches of the Masaruni, at least.

I take the word "radical" to refer to *root*. Mr. Williams will, I think, admit that the Makuchi language contains words of which the roots are distinct from the equivalents of those words in the other languages. I would not pin this statement upon such slender facts as the curious inversion of syllables in the name for cassava cake as is found in Makuchi and Akawatho—one has *eka* and the *aka*. While one may be justified in calling Makuchi and Akawatho dialects of a common language (I say *may* be justified), no one could reasonably call Arawak and Wapiana dialects of a common language with Makuchi.

That the Indian languages of The Americas are descended from a prehistoric stock may yet be demonstrated. But language study is difficult where the history of the peoples concerned is not recorded, nor known even by tradition.

To grapple with language study it is not enough to be able to speak several languages. Any ordinary person can learn as many languages as he desires. One must in addition study the construction of languages, comparative philology, phonology (science of sounds), and the principles of the growth of languages.

Be it noted : I do not claim to possess an *exhaustive* knowledge of such subjects ; but I have studied them with care.

Nor do I profess to know Makuchi and Akawatho through and through. I had a useful vocabulary of Wapiana (the Makuchi name for them) from our Wapiana nurse, and a few words of Arawak from a prisoner at the Penal Settlement.

My only claim is that my studies were on sound lines.

(My successor has worked upon wrong lines. I hope that he may take warning in time and not fall into those traps into which Brett and others have fallen).

Some people in Guiana, ignorant of the nature and extent of opportunities offered to me, and taken, for language study and original research, jumped to the conclusion that I was merely a novice beating wildly about the bush.

The paper by the Rev. C. J. Cary-Elwes, S.J., must have been very informing to those who had not previously thought out the matter at all, and to those who were ignorant of the rules which have guided the Royal Geographical Society. But it ought to be pointed out that the Society's method of adopting a script without diacritical marks was due to the fact—reiterated in its journal some months back—that the geographical requirements of cartography *would obscure diacritical marks*. The Society claims no more than that it has adopted a rough and ready method, and it nowhere claims that, for language study and literature, its method is ideal, or even sufficient. The Greeks used diacritical marks, and so do the French, Germans, Italians, and Spaniards to name but a few.

The reason for the need of diacritical marks is this : Languages, even non-tonal ones, are built up upon six, or more, long-vowels and (or) a corresponding number of short-vowels. Pure English has short-vowels predominating. French and other Latin languages have long-vowels predominating. Pure English is found in Northern England and parts of Scotland (I believe Caithness makes some big claims), while Norman (French) English is found in the South-East. The difference can be traced in such words as *grass*, *glass*, *dance*, *prance* : in the North the vowels are short, while in the South they are long.

While languages are so built up, the scripts adopted fail to meet the requirements without the use of diacritical marks ! The English Alphabet has only *five* letters (vowels a, e, i, o, u) to represent *twelve* sounds.

Note the sounds given to the vowels in the following words :

- a- Father played Bădmonton.
- e- Hē spēd.
- i- Ī saw it.
- o- Gō ōn.
- u- Ūse an ūmbrella.

i and u are really diphthongs ; two distinct sounds coalesced. In singing, as Father Cary-Elwes points out, these sounds must be separated to secure distinct enunciation. (The writer has taken singing lessons.)

We have no sign to represent the pure vowel-sound in *aught*. Nor have we a sign to represent the pure vowel-sounds in *boot* and *foot*.

But, while English is faulty, French is equally faulty ; though French does not represent a diphthong by a single sign. It does represent a single vowel by a double sign—eau = ō

French, however, *can not represent short-vowels* at all by any signs, *without the use of diacritical marks* or the arbitrary and unscientific method of doubling a consonant following, *e.g., cette*.

While the French can not represent short-vowels properly, Pure English can not represent long-vowels properly. We use the same characters of the alphabet but pronounce them differently.

While it is admittedly arbitrary to make two o's do duty for the single vowel in the word *boot* ; it is equally arbitrary to make a and u do duty for the single vowel-sound in *aught* (English) and *eau* (French).

We need a new alphabet, which shall allow each sound to be represented by its own sign. Until such an alphabet is evolved, scientific writing must have recourse to diacritical marks.

Compromise which means that both sides give up principles is wrong ; compromise which is the result of recognizing that differences are complementary is useful.

One hopes that some day we may agree to give the French pronunciation to the signs.

a (ah), e (aye), i (ee), o (oh), u (oo)—thus giving grounds to the claims made by Father Cary-Elwes, while adopting diacritical marks, in order to represent the short, the open and the long vowels :

- a (ann)
- e (sped)
- i (it)
- o (on)
- u (umbrella)—thus giving ground to scientific necessity.

We shall, then, have to agree upon signs to represent the pure vowels, which are sounded in :

aught, and paw, foot, put.

This might be done by placing the diaeresis over a, thus, ä and over u, thus : ü.

We should, then, have the twelve vowels—six long and six short—as follows :

Long :

a (ah), e (aye), i (ee), ä (awe), o (oh), u (oo).

Short :

ä (at), ë (pet), ï (it), ö (on), ü (but), û (put).

For Makuchi we should need yet another pure vowel sign, and it is a matter of indifference as to whether Father Cary-Elwes's e with circumflex (ê) or my u with a circumflex (û) be adopted. His is the result of a French bias : Mine is the result of an English bias.

The rough and ready method of the Royal Geographical Society (claimed to be *necessitated* by the requirements of cartography) fail utterly, when one has to write such words as *Makuchi*.

According to the Society's pronunciation of *a* (identical with the French pronunciation) the name would be pronounced Mah-Kuchi. But that would be incorrect, for the vowel is *short*. Were the unscientific device adopted of doubling the consonant following (which is k) we should write the word Makkuchi. But this device is hopeless when it is realized that it then becomes impossible to know when two similar consonants coming together are to be sounded separately *without shortening the preceding vowel*—as in Hindustani words.

Also, there is no means of shewing that a *final* vowel shall be short and not long, as in the common word, in Makuchi, for "our" *änä*.

Further, a script, to be scientific, must meet the needs of Eastern as well as those of Europe and the West. Had I adopted Father Cary-Elwes's method (that of the R.G.S.) I could not have committed Mawken to writing in any sensible way.

Note : I do not claim that my adoption of the English Pronouncing Dictionary's method proves that method is ideal (where, for example, oo represents the vowel in *boot*). I adopted it because its use of diacritical marks (the macron, breve and diaeresis — ˘ ˘ ˘) allowed of distinctions between long and short vowels (Fäther, cän) being shewn, and avoided the unscientific and confusing device of doubling a consonant to shorten a vowel.

There is no need to use the macron if it be agreed that a, e, i, o, u shall be pronounced as long vowels (French) where they do not carry the breve, ä, ë, ï, ö, ü, to indicate that they are short.

I must challenge the statement that the English o is really ou. It is not ! (Forgive the pun). Does Father Cary-Elwes really mean to maintain that, in singing, the *English* o is *slurred* so as to finish off as u (oo) ?

Is not this a French *misconception*? The English *o* should not be slurred into *oo*. There should be no contraction of the lips, even in singing.

Likewise the argument adduced in paragraph 4 on page 91 of "Timehri," is open to question. It does not in the least follow that learned *geographers*, nor even those who can speak several languages, are qualified to devise a scientific *script*, nor is a thing right because *many* people consider it to be so. And were the Royal Geographical Society to adopt diacritical marks as the result of its present considerations this principle would be illustrated forcibly.

I plead that this or that "authority" shall not decide the issue; but that right principles shall be sought and adopted.

A splendid opportunity offers of adopting a phonetic and scientific script, in which *one sign shall represent one sound and each sound shall be represented by its own sign*. (For this purpose a character with a diacritical mark shall be regarded as one sign.)

Had I continued at the Mission, I should have willingly adopted the *long-vowel* pronunciation for a, e, i, o, u, written without marks, did Father Cary-Elwes agree to use the breve to indicate *short-vowels*. Thus the use of the macron would have been avoided.

In order to make plain the script used by me—which is that of English Pronouncing Dictionaries—I give the following list of vowels and their signs.

ä	(ah)
ā	(aye)
ē	(ee)
ī	(eye)
ō	(oh)
ū	(you)
ă	(at)
ĕ	(pet)
ĭ	(pit)
ö	(pot)
û	(but)
ōō	(boot)
ōō	(foot)
aw	(awe)
û	(ê French)

i and u are of course diphthongs. The pure English *a* (as in *bade*) is not a diphthong, as may be shewn by the correct English pronunciation of *Mary*. In *played y* follows a and gives a slur.

It will be noted that in the script adopted by me there were no unnecessary consonants. c is unnecessary: k and s serve instead. q, also, is not needed, nor is x. On the other hand I did not write c for ch (as in the musical term *concerto*) z for t (as in *mezzo*) (Italian) nor *eau* for o (French).

Father Cary-Elwes and I are good friends and it is with great regret that I see no opportunity of continuing the study of Makuchi together with him.

It was not possible for me to deal with the question of diacritical marks while in Guiana. I am enabled to do so now through the kindness of the Clarendon Press, which has supplied me with the necessary type.

"KING WILLIAM'S PEOPLE."

THE STORY OF THE WINKEL VILLAGE, BERBICE.

BY J. GRAHAM CRUICKSHANK.

Aback of the residential quarter of "Queenstown," in New Amsterdam, Berbice, bounded (approximately) on the North by the Prison Farm, on the South by Vryheid street, on the East by Pln. Smythfield, and on the West by that aptly named road (which is the way to the Prison) called "Penitential Walk"—is a little village known as "the Winkel." An old man will say of his friend that "he does live in the Winkel" or of himself that he "just, just from the Winkel."

Although the Winkel Village is within the boundaries of New Amsterdam, as defined by law, and might be made subject to all the rules and regulations of that borough it yet lives a separate life of its own, yet breathes apart something of the old time when in his way the Winkel Negro was a somebody in Berbice.

Just now the village—like many another place illustrious in its day—does not bear many marks of fame. A mud dam divides its two rows, or wavy lines, of houses. Halfway through the village—from Vryheid Street to Ferry Street—the dam, although destitute of stone or burnt earth, is wide and ample and is kept free of long grass. Sweet potatoes and arrowroot and pigeon peas have been planted on the parapet. Then the abandoned lots begin to come—lots which are still rich in old fruit trees, star-apple and sapodilla and dark-leaved mango, but from which the human element (more fragile and more peripatetic than a vegetable) disappeared in some cases many long years ago. The road echoes this disappearance, and dwindles away to a mere foot-track between sourgrass and busy-busy. At night the Winkel Village is in darkness, save for such light as shines from a "door-mouth" or twinkles in the sky. The most remote inhabitant of the Kongo cannot more gratefully hail the light of the moon. There is no stand-pipe on the dam; the Winkel girl dips water from the Smythfield old punt-trench—deep in moka-moka and wild gooseberry, now—just as her great-grandmother did.

Immediately behind the fine flower of the aristocracy of New Amsterdam—within cry of an old house that once sheltered the Governor of Berbice—is this little primitive settlement,—*sans* light, *sans* water, *sans* a road that is walkable in wet weather.

What is the story of the Winkel Village? What is the meaning of "winkel,"—"anyway"?

"Winkel"—as any Dutch Dictionary will tell us—is a shop. A *winkel-jongen* is a shop-boy; a *winkel-meisje* is a shop-girl. And this simple bit of word-lore puts us on a track, which, together with a little research among the records—published and unpublished—leads us to the heart of the business. The Winkel Village is where the old artizans—

blacksmiths, masons, bricklayers (and perhaps brick-makers), coopers and carpenters of the old Dutch Colony, and later British Colony, of Berbice lived.

They were Negroes, taught trades, and employed for the most part on the Public Works.

Of course the early Winkels—the first artizans—were white men. They were indentured servants—the Christian servants of the 17th Century—blacksmiths and masons in the Netherlands, brought to the Wild Coast, to ply their trade in the forests and by the great rivers of South America. It must have been quite a number of years before the idea occurred to anybody that the Negro could be taught a trade. The Negro's head was wonderful for carrying things on, but not in. And then (no doubt) a Government Planter, up the river, noticed a Koromanti black trying to fashion something for himself out of a bit of old iron, and it struck him—it must have been like a flash of inspiration—'How would it do if I tried to teach this man to be a blacksmith?' Perhaps, after all, Kwasi had done a little rough iron-work in his own country, but Mynheer Mittelholzer—who had just picked him up from a ship sent by the West India Company—could not be expected to know this, and—being a prosaic, unimaginative man—he had never dreamt it. And so he bade his white blacksmith try him, and he tried him, and the black man made an apt pupil. Such was the origin—I make no doubt—of the first black Winkels.

In the beginning the Winkel Department—together with the Governor, his Secretary and the entire Administration—bar a lonely Sergeant with a soldier or two in a Brandwagt at the mouth of the river—was to be found in the vicinity of Fort Nassau, fifty miles up the Berbice. They were difficult to get at from the sea, and this was part of the idea, it was well in those days when privateers were about to be difficult to get at from the sea! Towards the end of the eighteenth century—after much talk—they descended to the coast. The second New Amsterdam—the town as we know it to-day—dates from about 1790. It was just about that year that axe and fire began their work at the junction of the Canje with the Berbice river. Dr. Pinckard—as we are told in his "Notes on the West Indies" (London, 1806) visited Berbice in May, 1796. "The town is yet in embryo," he observes. "According to a plan formed for its construction, it is to be built upon the angle, or peninsula, between the rivers Berbische and Kannye extending along the bank of the former. The land on which it is to be erected is in part cleared of its wood, and divided into lots ready for building, but, at present, only here and there a scattered house is to be seen. Beyond the prepared land, and not half a mile from the Government-house, the bush still overhangs the river Kannye. Government House, Pinckard thought, "beyond all comparison, the handsomest and most spacious edifice I have yet seen in South America. It is built near the river, with one front commanding the water; the other the town."

And just about this time—and just about the site of the Winkel Village to-day—there must have been built—although 'built' is prob-

ably too big a word for the putting up of such rude walls of sticks and clay and roofs of grass or troolie (mere benabs some of them) the huts that sheltered the first Government Negroes (slaves) in New Amsterdam. Dr. Pinckard visited a few of the Government negroes who were employed at the fort—Fort Andries, or St. Andrew's, on the other bank of the Canje, facing Crab Island. Their huts called to his remembrance the "cottagers' cabins in the Highlands of Scotlands." Just similar must have been the huts of the Negroes attached to Government House, who did the other work of the Colony at New Amsterdam.

"Queenstown"—the pleasant, ample, and quiet (albeit, at dusk, sandfly-haunted) "West End" of New Amsterdam—is certainly the oldest part, by far, of that borough. It is to New Amsterdam what the Brick Dam—which Pinckard describes, too: "a narrow causeway, paved with small bricks put edgewise into the ground"—is to Georgetown. It represents the—always interesting—"beginning of things." A few old landmarks may yet be noted in Queenstown. Perhaps the oldest is the "Brick House" (also called the "Red House") now belonging to Mr. C. H. Jones. The thick brick walls of this building—eighteen inches of small, red Dutch bricks—massive as the ramparts of some storm-beaten castle: the iron-hard twelve-inch-square bullet-wood sills—the very, very heart of the tree—impervious to time or termites: all tell of the good old days when Abraham Van Batenburg was King of Berbice, and Wolfart Katz could boast, probably with justice, that he had more slaves, and better ones, than any other from the Devil's Creek to the Abary.

Ancient—as antiquity goes in Guiana—is the building now All Saints' Manse. Ancient too—in keeping with the abode of its Minister—is All Saints' Scots Church, the old "Colony Church." It was opened in May, 1820, and Governor Bentineck—another "harbitrary gent"—who died six months after, lies buried in the chancel.

And then—behind Kirk and Manse and the "Brick House"—is the Winkel Village. There are no old buildings here—no old ruins, or tumbledown tombs, or other footprints of humanity—but the site, the soil, the ground in this locality, as the haunt and home of human beings, and those of a particular type, is as old as anything here and hereabouts.

It may be asked: How did the British Government come to own slaves? "The private planter we can understand—the expatriated Hollander or Scot—; no doubt without slave labour it would have been impossible for him at the time to plant and pick his coffee, to bill and boil his sugar. But His Britannic Majesty's Government, the emblem of Liberty, as a slave-holder!—the thing is odd. How did it come to be?

Well, as regards the Colony of Berbice, His Britannic Majesty became a slave-holder as the result of war. When the British Forces, for the third and last time, demanded the surrender of Berbice on September 23, 1803, the provisional government, feeling they could do nothing to defend the colony, drew up a series of articles which were concluded and signed the following day. The second of these reads as follows:—

"The plantations, lands, manufactories, workshops, slaves, effects, and possessions of the Berbice Association, of whatsoever nature,

shall be considered as private property in the same manner as agreed to by the capitulation to General Whyte in May, 1796."

To which the answer was :—

"All private property whatsoever, of individuals, is to be respected."

Now the Berbice Association—the nominal proprietors of Berbice—owned the Winkel Negroes (the black artificers of the Colony) and also four "Colony Estates." These were Plns. St. Jan, Dageraad, Dankbaarheid and San voort. In 1796 the estates—following the view taken by the French in 1782—had been considered private property; the Winkel Department—as we might say the Public Works Department—only had never been so considered. Now this view was changed and the "Colony Estates" were considered to be fair booty of war as well as the Winkel Department. It had been well had they not been. The Winkel Negroes, workshops, &c., were necessary for the construction and maintenance of public works; several of the Negroes were employed at the fort. The Colony plantations were of no public utility whatever. Water Street lights are never weary of asserting that any concern run by Government is bound to be a failure. Certain specific instances lend a little support to the jibe. The records of the Court of Civil Justice, on the other hand, contain a rather fair number of bankruptcies which had their origin in Water Street. In this matter of the Colony plantations—as opposed to estates run by private persons—the Government did not make a success of it. In fact, they failed badly.

In 1810 a proposal was made to the Government by Colonel Staples to lease the Winkel Negroes, together with the four Crown estates, for a period of twenty-one years. A lease was prepared, and had actually been signed by Colonel Staples, when a hitch came. As an after-thought the Imperial Government insisted on a clause being inserted that any deficiency of slaves when the lease was up must be made good by the lessee. To this Colonel Staples declined to agree, pointing out that on a retrospect of the management of those Negroes during the last four years, even under the Government's own agents, there had been a very grave decrease in the gangs. The decrease was put down to the unhealthy localities in which the estates happened to be situated. Colonel Staples did not propose to remove the estates from where they were, and therefore it was to be apprehended that certain further decreases might occur for which the lessee was not prepared to be pecuniarily responsible. The Government, however, were not prepared to waive the clause, and so the lease was abandoned, Colonel Staples being compensated.

Then came the "Berbice Crown Estates' Commissioners." This was a body of men, recruited in part from the Directors of the African Institution, whose mission was, not merely or so much to make the Crown estates, plus the Winkel Department, pay, but by a "different system" and by "other and by milder means" to reduce and finally to stop the mortality that was thinning the gangs. The Berbice Commissioners were The Right Honourable Nicholas Vansittart (Chancellor of the Exchequer), the Right Honourable Charles Long (Paymaster of the

Forces), James Gordon, William Smith, James Stephen, and William Wilberforce, with Mr. Zachary Macaulay, Secretary.

Berbice with considerable satisfaction saw itself relieved of the cost and worry of running these establishments. Among private planters there was some curiosity, not unmixed with anxiety, as to what the "different system" and "other and milder means" might be which the Commissioners would adopt in their management of the Crown Estates and the Winkel Department. Two of the Berbice Commissioners at least—(Mr. Wilberforce and Mr. Stephen)—with their Secretary, Mr. Macaulay, were stalwarts of the African Institution, a body which, formed in 1807 with the object of bettering the condition of the Negro (which wanted it) too often thought that this object might be best secured by worsening the condition of the planter. So long as the African Institution merely preached its projects for reform—"quixotic" as the planter called them—and printed them in an occasional pamphlet—no matter how mischievous such pamphlets might be when discussed openly in the West Indies—no grave harm might ensue. But it would be another story if the Directors of the African Institution, as members of the Berbice Commission, tried to put those projects into actual and visible operation in Berbice.

The Commissioners' first Agent in Berbice was Colonel McAlister, who, however, died within six weeks. He was succeeded by his assistant, Mr. A. A. De la Court. In December, 1814, Mr. De la Court was superseded by Mr. James Walker. Mr. Walker finds a place in local literature as the author of "*Letters on the West Indies*" (London: 1818).^{*} An appendix to this book contains a reply to criticisms of the management of the Berbice Commissioners. It is unlikely that any public body of men were ever more raked—in Parliament and in the Press—than were the Berbice Commissioners during these five brief years—1811 to 1816—of their existence. Mr. Joseph Marryat, M.P., prepared, and published "*An Examination of the Report of the Berbice Commissioners*" issued in 1814. Time itself has not withdrawn the sting from this document. It keeps hot wonderfully. Had the Crown estates and the Winkel Department been run at a profit? asked Marryat. No. Formerly so extensive and fertile had been the provision-grounds on the estates that a good revenue was derived from the sale of surplus plantains to the cotton properties on the coast. Now, not only did the grounds furnish no provisions for sale but they were inadequate to supply their own Negroes. Had the mortality in the gangs been reduced? No. From 1803 to 1811 (when the Crown estates and the Winkel Department were managed by the Berbice Government) the net mortality on the Estates had been 90 and the Winkel Department 11. From 1812 to 1814 (when managed by the Berbice Commissioners) the net mortality on the estates had been 62 and in the Winkel Department 22, or considerably more than double the annual average deficiency that took place under their predecessors. Mr. Wilberforce, as a Director of the African Institution, had protested against

^{*} Macaulay's lines say:—"Mr. Walker was sent to Berbice by the greatest of Statesmen and Earls, he went to bring back yellow boys, but he only brought back yellow girls."—J.R.

the inhumanity of the planter—insensible to local attachments—who removed his Negroes from one plantation to another. Mr. Wilberforce, as a Berbice Commissioner had approved of the abandonment of "St. Jan" and the removal of the Negroes to "Dankbaarheid."

Some of the Berbice Commissioners, as Directors of the African Institution, protested against the parting of "husband and wife": as Commissioners they removed the "wives" of many of the Winkel Negroes to Pln. Sandvoort, because that plantation wanted field women.

"Some of these very Commissioners" (concluded Mr. Marryat) "in their other character of Directors of the African Institution, are now actually endeavouring to manage and legislate for all of the British West India Colonies; it becomes important, therefore, in ascertaining their qualifications for the task, to enquire whether they have been faithful over the few things before they are made rulers over many."

In 1816 the labours of the Berbice Commissioners came to an end. The 11th clause of the Convention between Holland and Great Britain relating to the Navigation and Commercial Relations of the Dutch with Demerara, Essequibo and Berbice (dated August 12, 1815, reads):—

His Majesty the King of the Netherlands having represented to His Britannic Majesty that the Company of Merchants and Others (styling themselves the Berbice Association) have a just claim to certain estates formerly settled by them in the Colony of Berbice, of which they were dispossessed by the Revolutionary Government of Holland, and which on the capture of the said Colony by His Britannic Majesty were considered as Government Property, His Britannic Majesty engaged to return to the said Berbice Association within Six Months after the Exchange of the Ratification of the present Convention, the Estates *Dageraad*, *Dankbaarheid*, *Johanna*, and *Zandvoort*, together with all the Negroes and Stock now actually employed on the same, such Restoration to be in full Restoration and Satisfaction of all Claims which the said Association may have or may pretend to have against His Britannic Majesty or His Subjects on account of any Property heretofore belonging to them in the Colony of Berbice.

So said so done. The four estates, as named, were handed back to the Berbice Association. A Public Notice in the "Berbice Gazette" of July 24, 1816, recognizes Mr. C. J. Swaving and Mr. H. Staal as the Agents of the Association. The four erstwhile "Crown Plantations" (which we have noticed but briefly) now pass beyond our ken. It may just be added that in March, 1821, they were transported by "Hendrik Staal, as Attorney of the Company of Dutch Merchants and others in Holland styling themselves the Berbice Association," to and in favour of "Donald Charles Cameron of this Colony, and Henry Davidson and Æneas Barkly of London."

Simultaneously with the surrender of the "Crown Estates" to the Agents of the Berbice Association the "Berbice Commissioners" surrendered to the Berbice Government the management of the Winkel Department. They must have been happy to be rid of both. In the

Dutch times—as we gather from a translated document in Mr. Rodway's History—the Winkel Department made a “corner” in all the artizan work in Berbice. No private planter was allowed to engage his own carpenter. He had to hire from the Winkel. If he wanted a coffee-drogherie laid he could get it laid (on terms) by the Winkel. It was an intolerable burden, and the private planter did not fail to make his sorrows known, but with little result. The British knocked this monopoly on the head, and the Winkel Department simply secured what business it could on its merits. How, is shown in the following advertisement (“Berbice Gazette,” February 25, 1812):—

NOTICE.

Is hereby given, that all kinds of House Carpenter's, Boat-BUILDER's, Mason's, Cooper's, Blacksmith's and Coppersmith's work will be henceforth undertaken and neatly and expeditiously finished, on reasonable terms, by the Artificers of the Winkel Department.

Orders will be received and carefully attended to, by the subscriber at his house in New Amsterdam.

WM. SCOTT,
Commissary.

BERBICE,

15th February, 1812.

Then, as now, the bad paymaster existed. Another advertisement, dated from the “Winkel Office in the Colony Town,” “earnestly requests all persons indebted to the Winkel Department to pay Accounts or they will be put in suit”; while a further notice—with an air of drawing the line somewhere—intimates that “In future accounts must be settled monthly.”

Probably the most noteworthy achievement of the Berbice Commissioners—an act without precedent in Berbice—had been the employment of a Missionary for the religious instruction of the Negroes. The Rev. John Wray is yet remembered by one or two of the old people in New Amsterdam. He came to Guiana first in 1808 as missionary on *Plu. Le Ressouvenir*, the property of Mr. H. H. Post. In June, 1813, he went to Berbice as Missionary to the Crown Negroes.

The Rev. T. Rain's book, “The Life and Labours of John Wray” (London: 1892)—compiled chiefly from Mr. Wray's journal and letters—gives us many glimpses of the Winkel Negroes. In 1813, the Crown Slaves in New Amsterdam numbered 355; they were chiefly trades people. 30 of them were attached to Fort St. Andrew; a battalion of no fewer than 65 were employed as servants at Government House. Travellers in the West Indies—as in the Southern States of North America—in the old time record, almost with a gasp of horror, the retinue of servants attached to the old Great-Houses. The Government House of Berbice made a brave show in this respect. It is interesting to remark how those 65 servants were made up; we find the details in Mr. Wray's biography. There were 6 house-boys and 8 washerwomen, 14 housemaids and seamstresses, 3 cooks, 3 ostlers, 3 gardeners, 3 stock-keepers, 4 fishermen, 2 grass-cutters, 2 woodcutters and 17 boatmen. It is notable that there

were no coachmen ; there was probably not a wheeled vehicle in Berbice. The 17 boatmen are eloquent of the fact that beyond a little riding, all travelling in the colony was by water. No mention is made of huntsmen. Bush meat no doubt was brought in by the Indians.

Reverend gentlemen of an evangelical persuasion were not welcome in a slave colony as a general rule, and Mr. Wray encountered opposition which no doubt he expected. His photograph shows us a burly Yorkshireman, not readily daunted. His chief disappointment, perhaps, was the Negro himself. The spirit was willing but the flesh weak. He made an emotional convert, but—with striking exceptions—a bad "stayer." At times the good missionary lamented the turpitude of his flock. "It is possible to instil more evil into their minds in five evenings," he records in a report to my Lords Commissioners of the Treasury, "than good in five years. I have been obliged to repeat an answer in Dr. Watt's catechism a thousand times before some of them could learn it, and I have too often found to my sorrow that what I taught them one evening they forgot before the next."

Nevertheless there was progress ; and the wonder is that in a colony where—as it was said—"few had ever heard a church bell," so much was achieved. Mrs. Wray started a school among the girls, and taught them to make clothing for the Crown Negroes. No doubt the following advertisement—published in the "Berbice Gazette" of March 21, 1821—may be traced to Mrs. Wray whose pupils by then—greatly to their delight—must have been getting somewhat "forrader" :—

NEEDLE WORK.

Is taken in at the Winkel School. It will be executed at moderate terms. The Schoolmistress will wait on any Family to take their orders.

Negro Clothing also, for men, women and children is made up at the Winkel Establishment where every endeavour will be made to give satisfaction to the Public.

It is pleasant—in Mr. Wray's biography—to read the memories of the Winkel Village by Mr. Wray's daughter, Mrs. Tucker. "The Winkel" was "only a pleasant walk" from the Mission House, then, as now, on the "Back Dam." "My mother was in the habit of sending us when we were children, accompanied by a servant, to the village to see the poor old people, and to convey to the sick some little comfort, such as wine, &c. I remember them well. Daddy Tom, Daddy Gabriel, and a good many more."

On June 8, 1837, Mr. Wray died. He was fifty-eight. He is buried in the old Stanleytown Cemetery. It is probable that the good work of Missionary Wray—"a'we Parson"—and of Mrs. Wray is yet visible in the recent life and common faithfulness in small things of some of the descendants of the old Winkels.

In 1823 a second proposal had been made to hire the Negroes of the Winkel Department as a body. Now, it came from a Mr. H. Armstrong. Nothing came of it, partly, as it would appear, from the anticipated

opposition from the Winkel Negroes themselves,—“most of whom from their infancy having been under the Government consider themselves negroes above the ordinary class and are most satisfied by being under such authority.”

In November, 1831, the Imperial Government—in spite of objections against such a “sweeping emancipation” urged by Governor Sir Benjamin D’Urban—liberated all the Winkel Negroes. They numbered 298. Their approximate value (on the basis of slave property at the time) was £14,900. It is curious to note as one of the instructions to the Superintendent that: “if it should happen that any slave should desire to decline the offer of freedom he (or she) *must* nevertheless be emancipated. “Daddy Tom” or “Daddy Gabriel”—who got his leaf of tobacco and his drop of rum on a wet day—did not pant for freedom. He was very comfortable, thank you, as he was!

The following Notice was read and carefully explained to all the Crown Servants:—

To the Crown Servants, Winkel Department, Berbice.

1. The Governor has the satisfaction of announcing to the Crown Servants that His Majesty King William the Fourth has been graciously pleased to command that they shall all receive their Freedom, and they will accordingly receive it as soon as the Deeds of Manumission can be prepared and executed.

2. The King has also been graciously pleased to direct that all of those now living in dwellings belonging to the Crown may continue to reside therein during their lives, on condition of their keeping the said houses in proper repair.

3. His Majesty has further benevolently commanded that those who are now old, infirm or insane, the bedridden, blind or otherwise helpless, the infants and young children who have no parents capable of taking care of and supporting them, shall be maintained, as at present, at the expense of the Crown, so long as they shall continue from such helplessness and infirmity to stand in need of that maintenance.

4. With these exceptions, however, the Crown Servant will be aware that upon their manumissions being delivered to them their present allowances from the Crown will cease, and they will be expected to maintain and provide for themselves by their own industry, and they are therefore recommended without delay to think of such employment as they may be most fit for respectively, and as may be most profitable to them, that when they receive their manumissions they may immediately commence that employment for their own support.

5. In conveying to the Crown Servants these gracious intentions of the King, the Governor feels confident that they will all endeavour to deserve them by an orderly, industrious and respectable course of life.

B. D’URBAN,
Governor.

KING'S HOUSE,
Demerary, 22nd October, 1831.

The Deed of Manumission took the following form ;—

To all to whom these presents may come Greeting: Know ye that His Most Excellent Majesty King William the Fourth hath been graciously pleased by His Royal Command officially expressed by the Secretary of State for the Colonies, and communicated by him to William Scott, Esquire, Superintendent of the Crown Slaves in Berbice under date 22nd October, 1831, to impart the Boon of Freedom to each and every of the Crown Servants (designated in the former Colony of Berbice as Winkel Negroes).

In pursuance thereof I, William Scott, representing the Lords Commissioners of the Treasury, do manumit, enfranchise, renounce and redeem from Slavery

(Here follow names)

WM. SCOTT,
Superintendent Crown Property.

1st November, 1831.

A Deed of Manumission was given to the head of each family, and embodied his or her name with issue.

It would be interesting did one know how the Winkel Negroes—liberated from slavery that had never within recent years been irksome—used their freedom. It was an experiment—far short of the "grand experiment" then in the wind but bigger than anything yet tried in Guiana. Slaves, of course, had been manumitted from time to time from the very beginning. Winkel Negroes, in ones or twos, had similarly been freed; in April of this year, 1831, we read how my Lords Commissioners of the Treasury as a reward for good and faithful service had granted Letters of Manumission to the Winkel slaves Arsenie and Truitje with their respective children, ten in all. But these were sporadic manumissions. They did not count against the mass. This was a bigger thing altogether.

Unfortunately our information is limited. A philosopher has said that no change ever turned out so well as some people expected or so badly as others feared. It was probably so with the Winkel experiment. In the "Life of John Wray," there is the following extract under date February 18, 1833, from Mr. Wray's Journal :—

"A few days ago the Bishop of Barbados visited Berbice and held a confirmation. He took an opportunity of visiting the Winkel negro houses, going into many of them, conversing very particularly with the people, inquiring what place of worship they attended, who taught them to read, hearing some of the little children repeat a hymn and Watt's catechism, and expressed his pleasure at what he saw and heard. A report had reached Barbados that they were abandoning the village, would not work, and were allowing their houses to go to ruin; but he told Mr. Scott, the late Crown agent, that he saw anything but deterioration. Mr. Scott told him that a few of the young people had gone to Demerara and other places because they could

get better wages; that one of them (whose name his lordship recognized) was even engaged in painting the cathedral in Barbadoes; that it was true they would not engage in field labour because they had never been accustomed to it, but were, in general, excellent mechanics; that as to their houses many of them had been in a state of delapidation because Government, undecided for some years what to do, would not go to the expense of repairing them; but that since emancipation most were improving their houses, and some were building excellent ones."

Many of the people in the Winkel Village as we have seen—went away. Some left because there were better prospects elsewhere. Others wanted to "stretch their legs." They had been tied by the leg all their lives and had now been untied. They wanted to "feel free." Many of the people, however, remained in the old locality. They were too old to travel.

Half a century passes: many of the old "Crown Slaves" die out; their children grew up, and they had children: and the Winkel Village yet remains a separate entity, the old heads, on idle nights, passing on their tales of the past when King William took an interest in his village and in his own, own people,—“King William’s People.”

The old promise (it will be remembered) when the Winkels were emancipated, was that they should be secured in the possession of their houses, so long as they kept them in repair. On September 30, 1890, the Combined Court—on a Petition on behalf of the Winkel Villagers, by Mr. William Pitt (“Carpenter-boss” in New Amsterdam) who was a Winkel descendant, and of Mr. C. B. Carto (Schoolmaster) who had married a Winkel descendant—authorised that “portions of that piece of Crown land known as Winkel Village” should be made to certain persons named, “the said persons being either former slaves, or descendants of former slaves, claiming certain interests in the said village.” The “former slaves” then alive were as follows:

MALE.

Lyander Bernard.
Richard Downer.
William Thorne.

FEMALE.

Priscilla Rose.
Sally Headicker.
Harriette January.
Rosaline Fredericks.
Johanna Prince.
Mrs. Myres.
Susan Rose.
Charlotte Fredericks.
Ann F. Gournal.
Elizabeth Ferdinand.
Grace De Wall.
Lydia Houston
Rebecca Wolff.
Madeline Denba.
Elizabeth Dykeman,
Louisa Marimees

The "descendants of former slave" numbered thirty-eight.

The Grants were issued subject to the condition :—

That the said Lot No.— shall be maintained by the said his (or her) heirs, executors or assigns at all times in good sanitary order and repairs, and shall be at all times subject to all Laws and Enactments for the control and superintendence of The Town of New Amsterdam.

In subsequent years the Winkel villagers laid claim to "No 27," or Pln. Berensteyn, on the left bank of the Berbice River, and to land adjoining Banin Creek, a tributary of the Canje. In the old days Pln. Berensteyn—an abandoned coffee-estate—had been used as a provision-ground and as a source for the supply of wood for the Winkel village while in the Banin Creek, fish—hassar and yarrow—had been caught in dry weather by the Winkel people, and brought to New Amsterdam—and even sent in barrels filled with water to Georgetown—for sale. Grants of land at both these places were issued to the Old Crown Slaves and descendants of old Crown Slaves by the Government. They were subsequently revoked on the ground of unbeneficial occupation. The Winkel villagers still enjoy fishing rights in the Banin Creek.

To-day, as far as I can discover, only one of the old Winkel slaves is alive. This is Ann F. Gournal, who lives in King Street, New Amsterdam. She is upwards of ninety. The old lady is "getting down," as possibly might be expected, but her "intellects" are good, and, to a sympathetic listener she can tell something of the old days when the Winkel people "were massa and missy." She cannot have been more than about seven years old when the Crown Slaves were emancipated. Of the great event she remembers nothing. There was a "great stir" in the village, great excitement, that is all. She had her mother's (and family's) Manumission Paper at one time, but someone "borrowed" it from her husband and she never saw it again. It was a long paper, tied with blue ribbon and had a big red seal.

"We was freed with paper" said Mother Gournal, "We was different from the rest a people what freed with bell." This was in allusion to the plantation slaves—freed *en masse* August 1, 1838—who had no Manumission Papers. "We use to laugh them, call them 'Prentice Labour.'"

The Winkel Negroes were the aristocratic Blacks of Berbice. They belonged to King William. They were not Planters' slaves. The descendants of Africa—and the old "salt-waters" themselves—in Berbice were ranked somewhat in this fashion :—

1. King William's people.
2. Planters' people.
 - (a) Drivers, artizans and house negroes.
 - (b) Field hands.

The Winkel Negroes were "top dog," and knew it.

All of the births in the Winkel Village (said Mother Gournal) were recorded in the Court House, as well as all the deaths, with what complaint they died of, and this had to be sent home to King William who was very fond of his people and wanted to know all about them. One

time, her mother told her, the people sent home a lot of things to show King William what they could do. "What things?" "Well, according to what they could make." They sent home a little hogshhead made by a cooper, and a table made by a joiner, and some ironwork made by a blacksmith, while the women made some shirts to show what they could do. "King William was very pleased, "they say," to see what the Winkel people in Berbice could do."

Mrs. Gournal never saw Sir Benjamin D'Urban as far as she knows. But she saw Sir James Carmichael Smyth, and remembers his appearance well. He was tall and had no hair on his face. There have been one or two Governors of British Guiana whom the common people remember with affection. This was not because they spoke smooth things, or gave way to every popular demand. Usually such Governors have been singularly frank with the people—have told them things that from the lips of another would have raised an unlayable dust. But it was felt that they had their welfare deeply at heart, and were determined, looking neither to the right hand or to the left, to do them justice and to try from quarters not merely high or official to get at the truth of the matter. Sir James Carmichael Smyth was one such Governor. A later Sir James—Sir James Alexander Swettenham—occurs to us as another.

"Sir James Carmichael," that is how this old Winkel slave refers to "the good Governor." "He was a good Governor;" it is her phrase. She remembers when he visited the Winkel Village. The people must have been free then for about two years. He rode into the Village on a horse. He had on a uniform, with a cocked hat. The people had swept the Winkel clean and had put up flags. They all came out on the road and clapped their hands and cried: "Hip, hip, hurrah! for Sir James Carmichael." He then visited the school and spoke kindly to the children and promised them medals.

Indeed the entire body of the people were children,—to be encouraged, to be lifted out of the mud, to be led into the elementary paths of life.

Then there was "Parson Wray."

He was "inclined to be stout," and spoke very slow. Mrs. Wray was a quiet woman, and had four daughters and one son, Master Robert, who died in Demerara from the Yellow fever. Of the daughters, Miss Rebecca, she had married the Revd. James Howe—she was the oldest. Then there was Miss Betsy, Miss Janey and Miss Emily. They taught in Sunday school; some of their scholars were old enough to have been their grandmothers. Most of the old people could read a little (without glasses) although but few could write.

Mother Gournal remembers—"ah, day of mourning"—when "Parson Wray" died. He had a big burying. She and all who could get to the grave went. It was a day of pouring rain.

Of the Winkel descendants—Mary Henery, Charlotte Duke, Flora Beresford, etc.,—who still live in the Winkel, the eldest is Henry Ferdinand. He is about seventy-six. He is a carpenter. His father and mother had been Winkel Slaves. His father in later years supplied most of the ships that came to Berbice with water and vegetables.

With Ferdinand I discussed the old lights of the Winkel Village. All of them have gone out. Five and twenty years ago—ten years ago! I might have met some interesting characters in the Winkel had I thought of walking that way. But I never thought of it. It became rather tantalising to hear this sort of dialogue between my guide, philosopher and friend, and somebody else, not once but two or three times.

Ferdinand (by way of introduction):—"He wants to see any of the old Winkel people."

(Woman) at a wash-tub:—"Oh, dear me. Partly all of them is dead out."

Ferdinand: "Partly all! You should say all."

Woman: "Well indeed, all."

Ferdinand: "How if he had come when old Henry Schwartz was alive."

Woman: "Oh, don't talk. Henry would have kep' him from morn-ing to night with the old-time story."

Ferdinand: "Mother Baker even?"

Woman (pursing her lips): "Well, Mother Baker, yes, was an ageable woman, but nothing to Henry. Mr Ferdinand, you know, some of them old people, you know, they got the particulars and so in they head, but they ain't like they want to talk much."

Ferdinand: "That's so. But Mother Baker, get hot on her good day, she could be very chatty."

Woman: "So she could. So she could."

Henry Ferdinand just remembers—or thinks he just remembers—his great-aunt, Dorinda Van Batenburg. She was a tall woman, and very black. She had been a woman of note in her day, among the white people. She had been a nurse in the family of Governor Van Batenburg, and had taken the name. She had gone to Holland and England with the family two or three times, first to England, in 1816, when she became free. She could speak Dutch fluently—not Creole Dutch but pure Dutch—and English fairly well. She had five slaves of her own, and got "compensation money" for them when they were freed. She died about 1851.

Another great-aunt was Priscilla Rose. She was his grandfa-her's sister on his mother's side. "Aunty Rose" (as they called her) was famous as a cake-maker. Not a wedding of importance took place in Berbice but Priscilla Rose made the cake. She could do other things, too. Her guava-jelly was in demand. We import our pickles now-a-days. Then Priscilla Rose made pickle for the white people in Berbice,—pickles in patterns in the bottle, white mountain cabbage, red peppers and green papaw. She died about 1898, aged (it was believed) about a hundred and ten. She was sensible up to the last: could read the finest print and thread the finest needle.

And talking of a needle, there were some good "needles" in the Winkel Village before-time. Many of them had been pupils of Mrs. Wray. "My mother" (said Ferdinand) could make as "fine a shirt as you would want. Many a time a Captain would order half a dozen shirts, with pleated

bosoms, from her and take them away to show what the black people in Berbice could do." As for patching clothes, the old Winkel people could patch a blouse so that it looked naturally new.

Other of the women could wash. They washed for the Governor and the officers at the Fort; and some of those officers, if report be true, would have died rather than not appear in the whitest of linen. A story is told of one of the old Winkel washers. She had gone to the Fort on a Monday morning and brought away the Colonel's washing. Late that afternoon the Colonel sent a messenger running to ask, had she seen any money in his trousers pockets? No (said Aunt Judy) she hadn't seen none. All she had seen was one or two little pictures, and those she had stuck up on the wall. "And there, sir, were the Colonel's good, good Joe Notes stuck up with starch on Aunt Judy's wall! They say they had work to get them off.

Most of the old lights are associated with a trade. They could all do something and did it. The women could wash, or sew, or bake—if only in a mud oven—or make preserves. The men could build a house—the Mission Chapels, first and second, were built by Winkel carpenters, as were the first houses in Queenstown and the "Colony Church"—or lay a copper-wall, or make a crabwood bedstead, or forge a horse-shoe, although few of the horses on the old mud-dams were shod. We took a walk—Ferdinand and I—one wet morning to the site of the old blacksmith's shop. The village smithy went to bits long ago. My guide does not remember it himself, although when a boy he found many pieces and scraps of iron lying about here, and buried in the ground. The place is now high in grass. This part of the village is called "Guava Bush" from its number of wild guava trees.

We came upon water.

"Now this, here, is the Winkel Pond. This is here where they used to bring we poor children five o'clock in the morning—dark and very cold—to bathe. We would stand on the dam, and our mothers would dip water from the Winkel Pond. In those days the Pond was kept clean,—none of this grass and weeds you see now. The Winkel Pond! Ask any of the old people—of course they are all dead and gone now—about the Winkel Pond!"

Just about here, too, was the hospital. "I remember about forty years ago there was just the pillars standing, and one or two old beams. The people had good attention in those days, you know,—oh yes, any complaint at all, they went to the Winkel Hospital and the doctor prescribed for them."

Nowadays half the people in the Winkel know nothing at all about the village. They are strangers. A few are connected, in some round-about fashion, with the descendants of the old Crown slaves. A number are strangers. They know nothing of the traditions of King William. All they know is that they have a little plot of land to settle on. They are there by permission of the original grantees.

In a few years, I suppose, the story of the Winkel Village will have been forgotten. Many of the descendants of the old Winkels have

"scattered." They will scatter more. Death is taking off the old-timers and it is doubtful if their offspring are sufficiently interested in the old memories and traditions to keep them alive. The very name "Winkel" has been altered. It is now "Winkle." It is "Winkle" even in the (otherwise) authoritative pages of the Post Office Guide. It will puzzle the historian of a hundred years hence to account for this "Winkle." Perhaps if one walks as a "Jumbi" on the old mudflat, at that distant day, he may be amused to read in the historian's "Topography of New Amsterdam" this erudite little note:—

Winkle Village. The name is obscure. Possibly has some connection with periwinkle: *Fulgar canaliculata*. Perhaps there is some humorous association here with "Mr. Winkle," a character as the book-hunter will remember, in a classic of our great-grandfathers "The Pickwick Papers." "Mr. Alfred Jingle" went to Demerara.

THE "GOOD OLD TIMES" IN GUIANA.

A HISTORICAL STUDY,

BY J. RODWAY.

Were there ever times that might be considered really good? Some old people praise the manners and customs of their childhood, but the young are more inclined to speak of "Good times coming." The outlooks are different but there is no real contrast; the conservative and progressive ideals are always working together for betterment. If we are well-balanced we hold to what we think good but do not hesitate to move on as we see our openings, feeling that however good a thing may appear it is always open to improvement.

When we gain some real knowledge of the past in place of fancies we see that we exist to-day and have our comforts and conveniences because our ancestors did certain things, some of which we can only deplore. To mention only one, slavery; our colony and many others would have been worse off to-day had it not existed. Even cruelty once so common, led to such a revolt that flogging in the army and navy as well as in schools was abolished. Possibly the present horrors in Belgium will cause such another revolt against war that our descendants will enjoy more peace than the world has yet seen. "Perfect peace" however is not in accordance with the nature of things, for there must be always room for progressive betterment.

Those who look at the past as if things were better than at present, are in much the same position as those who formulate Utopias; both ignore much that should be taken into account. We of to-day would miss many comforts were we transferred to the "good old times," but our ancestors could not miss what they had never known. If a boy was flogged at school or a soldier got the "cat-o'-nine tails," they were not alone, for it was the rule. What horrifies us nowadays, and probably had the same effect on our ancestors, is abnormal crimes. What happens in the regular course of things makes little impression; hanging was once less shocking than it is now because it was so common. There is always a tendency to take notice of what is rare and extraordinary, hence much of our knowledge of old times comes from reading about what was considered strange and wonderful. It was not so strange for a woman to be flogged at the cart-tail and therefore little attention was paid to it. In looking back to find what we remember best of our childhood days we find that every-day life cannot be recalled, but only events that were quite abnormal. We can easily understand that a case of extreme suffering will make such an impression that the whole life may be dominated by the painful memory. Extremes of pleasure are also remembered when perhaps painful experiences have become mellowed, hence an old man sometimes looks back and speaks of the days of his youth as more pleasant; the idea is also prominent in the expression that someone has "seen better days."

It is impossible to put ourselves back in time so as to see with the eyes of our ancestors; it is almost equally difficult to put ourselves in others'

places. Here we have people trying to judge the so-called savage and speaking as if he felt what they consider drawbacks. Humane and tender-hearted people feel sad when they look upon the poor of their own or other countries, who have few comforts and conveniences which would be exceedingly painful for them if wanting in their daily lives. Most of us have some likings which are necessary to our comfort but we do not always consider that others have not the same tastes but their own peculiar ideas of what is necessary. We can easily see that were it possible for one of the old fogeys to come down and live with us they would be grumbling and finding fault with many things we do which we could hardly avoid even did we wish to do so.

The historian, if his judgments are to be of any value, must try to do the impossible, that is, look upon the events of the past with the eyes of contemporaries. Although however, he cannot do this altogether he can try his best so as not to make the common mistake of putting up wrong standards. The standards of time and place vary so much that he must be changing his views and trying to change himself for every period that he is studying. Again, his efforts are made to see an event from several aspects, including the many sides represented by kings, lords, commons, people, governments, planters and slaves, buyers, sellers, aborigines and settlers, as well as a host of others. The result is bound to be faulty but we must give him credit for what he has tried to do.

The traveller of the olden time saw much more than he of the present day who wants to rush round the world in a month or two. He was however far more credulous and reported what he heard or supposed that he was told. Foreign languages have always been drawbacks and are so still, but there is a point which has to be noticed, *i.e.*, misrepresentations through interpreters. The man who poses as an interpreter is so rarely exact in giving a word that is near to the real meaning of the original that the historian must be doubtful of all old interpretations. The principles at the bottom are only now being understood to mean that we must get at the back of the word and peep into the mind of him who uses it before we can venture to translate it. Even when we attempt to get translations from European languages into our own we are sometimes at a loss, hence the original expression is often quoted. Linguists know too well the various readings of translators from the classics, and we may safely state that no one represents the true meaning of the author. Even in our own language we find words understood in different senses by different people; were we sticklers for exactness, many common words would have to be defined by the people who use them. Old writers often put ideas into the minds of foreigners that they would not have understood if they had been consulted. Hundreds of popular notions have been derived from such misrepresentations, some of which are so fixed that we can hardly expect that they will ever be rectified. It is hardly necessary to give examples, but we may only mention the fact that the average negro uses words that sound magniloquent when he has no idea of their meaning. Those who hear the statements of witnesses in law courts

know well the difficulty of getting reliable evidence. This goes to show what the historian has to do when it is quite impossible to examine witnesses. The most he can try to do is to get as near as possible to what is supposed to be meant.

If the meaning of words is often misunderstood it can be easily seen that habits and customs are even more difficult. The anthropologist has come to the front in quite recent years and his assistance to the historian is of the utmost importance. In some cases important results have followed the breach of an old custom, the meaning of which is even yet unknown. Much has been written about slavery and yet hardly one of the writers knew anything of its value to Africa, of the meaning of the trade, and of its importance to the welfare of the continent. As slaves were the only merchandise in the larger portion there could have been no traffic without them. A man's riches consisted of slaves—they were sold, exchanged and even used as standards of value, *e.g.*, "Pieces d'India" meant healthy working men, equivalent to a piece of money. It is only of late years that we are beginning to get peeps into the minds of primitive peoples, who however can hardly be considered rational. This is a common failing even among those more civilised for we may safely state that no man is rational at all times.

Wrong deductions are often made because the writer assumes that other people act as he would under similar circumstances. The student knows that people do not respond in the same way and therefore the same cause acting on a number of personalities may produce almost as many effects. Even in a family the members do not respond in quite the same way, one gets angry, another is frightened, a third makes an alarm and so on. With other nations and races we often have no criterion from which we can judge of their actions when excited or disturbed. Women do not act in the same way as men, and children have their own ways of showing fear, anger, malice, spite and revenge. Then we have the difference between the drunken and the sober, the healthy and the weak, the sanguine and the phlegmatic. If we are fairly acquainted with a man's character we can sometimes be nearly correct in judging of his probable actions under certain circumstances. If therefore something inconsistent is reported we must be very cautious in sifting the evidence. Some rulers have been credited with false characters by their enemies or their friends; sometimes these are so contradictory that both must be ignored. Cases are known where actions have been ascribed that were practically impossible. Novelists offend in many ways, one of the most common is the anachronism where a weapon or utensil is put in the hands of a character, who is supposed to live at a time when it was not invented. One writer makes his hero put a percussion cap on a pistol in the time of Charles the second. We may of course say that this is not history, but even romance must not put things entirely out of place.

The great fault of old histories is ignoring the life of the people. The characters are few and exceptional, the consequence being that we get nothing to put us in real touch with the period. Much has been

done by the antiquarian to rectify this drawback; the materials for his work are of the utmost importance, and are often more valuable than government records, though not so precise as to dates.

Too much stress is generally laid upon the exactness of dates and some have disputed about a day or two as if it were more important than the event itself. Chronology comes in here but we must be suspicious of all old dates. It would be well to get more general ideas of times, because there were antecedents and consequents connected with most events which could not be dated. A battle fought on a certain day depended on the movements of the two parties for weeks or perhaps months before. As far as possible we should try to comprehend something more than the battle, however decisive that may have been.

On an old tombstone in the Chapel of Farley Castle I first read the words "Time trieth truth" some sixty years ago and have remembered them many a time since. I can picture the old knight, one of the Hungerford family, who quoted the saying some four centuries ago and perhaps understood it in his own way. We are now appreciating the fact that time is trying all our histories and proving most of them to be imperfect and distorted. Many of us who learnt what was once called history found it very dry and tedious. Real history however should be interesting to everyone, especially when they know that they themselves are making it every day of their lives. The querulous old woman who tells us all about the relatives of a certain family is a historian in a small way and the old man who remembers an event of his childhood is another.

In studying the history of a colony like British Guiana we have to make a start with things as they are before going to old books and records. It is quite evident that what we see to-day is more tangible than documents. Every building has its history and so has each plantation, village and town; we can go farther to study people for they also are "heirs of the ages," and family history cannot be ignored. Not only must we deal with what are called "great" families, for every person in the community has affected the whole in some way. Some historians are inclined to deal only with the ruling families, but it can be easily seen that the prosperity of a country depends far more upon its working men than upon the rulers. There could be no government were there no subjects—the two are inseparable. The old writers generally ignored everyone except the rulers and spoke of Generals and Admirals winning battles. Surely some credit is due to the body of men as well as the leaders. If British Guiana is fairly prosperous to-day its position is not due to the Government but to the people. Good government however is not to be ignored but put in its right place. The development of our colony could not have come about were there no negroes to be obtained in earlier times and no immigrants in later periods. Every man in a community helps, and even when he sometimes appears to hinder, his actions may be lessons worth taking to heart. In the constitution of things it appears as if even criminals are useful to warn us of what should

not be done. As individuals we learn from the results of our errors and the community can do the same from the blunders of some of its members. Because certain things were done and trouble resulted, laws were required and police became necessary. The continuous chain of antecedents and consequents must be studied by the historian although he will never be able to peer into the dark obscurity of a beginning. He may perhaps trace back a family for a few centuries but there will always be a full-stop in the evidence, though we can be sure that the family did not begin at that place or time.

Racial characters have to be considered; these are often the result of habit, custom and instinct. Although man is generally considered rational there is very little reason in his more common actions. What a negro will do under certain circumstances is not the same as the action of a Chinaman, East Indian or European. The historian gets ideas of possibilities and probabilities from different events and can often say what might be expected from members of each race. It is notable that in our colony negro riots differ much from the troubles among the East Indians who are more rational and therefore attack those only who are supposed to have wronged them. In the one case there is a kind of madness similar to that of the drunken man who smashes his own furniture, in the other a grievance to be redressed. When a disturbance is reported we can often get nearer the truth if we know something of racial characters.

Every person in the community is a historical record and if we knew all about them and their ancestors we should often get over some of the many difficulties we encounter in our studies. The plants in our gardens are mostly foreign but few of us know when and how they were brought. Even plant pests are sometimes introduced in soil or on specimens; many weeds are distributed in fodder or packing materials. When we travel in the interior and find mangoes and bread-fruits we know that they must have been planted later than the time when these trees were introduced and that therefore the land on which they grow was occupied about a century ago. Beads, axes and knives in the hands of native Indians show European contact, even when perhaps the people using them never saw white men. Bush negroes in the forest are peculiarly interesting because they are descended from Africans and have become fitted to a new environment.

There is a very important matter in connection with our judgment of historical personages. Few of us ever ask ourselves whether a course taken was not the best under the then *known* circumstances. If a man fails we often say he was bad or foolish, and if he succeeds he must have been wise. This is not necessarily the right judgment, for with all our thinking we are bound to make some mistakes. The natural results are consequences, not of motives but of actions, and only good results stand real tests. Sometimes we call a man bad, when all the time he is trying to do what he considers best. There is only one criterion of conduct and that is the ultimate result, which may not come for a long time.

It is a common saying that if such a thing had not happened results would have been different; some try to define these probable differences. But we must not be too hasty. If, for example, Columbus had not discovered America when he did, someone else would have done it within a few years. We often put down some one as an inventor and give him all honour when perhaps others come in to make the machine workable. It usually happens that the thing is "in the air" as it were; the time comes and the man or men are ready. Conditions appear to arrive where necessity becomes the mother of invention.

To the student of history many things appear to have been wrong and yet on the whole results proved that they were expedient. All Governments put expediency first however they may talk about right. It is very hard to define right, especially beforehand. We often try and fail—the failure proves that we were wrong. Motives are more generally good but only success can prove that the course was right. If a country is still inhabited there has been no real failure as far as man is concerned. No matter that the people have been coerced and perhaps suffered under tyrants, if it is even a little progressive there has been no failure, Individuals fail but man as a whole is a grand success, in fact the grandest success the world has ever known. The main principle of his actions has always been expediency and results prove he was right. In studying history this principle must be kept in view and in trying to judge our ancestors we must look upon the results, and not be too hasty in calling them cruel and bad when they acted according to their light.

Because certain things were done in the past we live to-day. To say that the people who lived and enjoyed life in former times were much worse than ourselves is not a right judgment. We know more than our fathers and our children will, no doubt, increase in knowledge, but the point to be accepted, is that each generation is well fitted for its own time. Because we have advanced and risen on the shoulders of our forefathers does not mean that we are greatly superior. We are what we are because they were what they were. Here and there we find men in advance of their time and we are inclined to call them cranks; if we could be put back a century the people of that time would call us cranks. Now and then we hear the descendants of the slaves speak of the old planter as an ogre, but they do not call their ancestors savages. The historian tries to look on the past from the standpoints of the people then living but this is very difficult. The main point to be considered is that a progressive world must necessarily admit of improvement, and yet that on the whole it has always been good.

History cannot repeat itself for we can never go backward. Circumstances however are often sufficiently alike to be lessons, which, if well considered, help us much in our onward path. Slavery has gone and the coolie immigration is going; they had their day and must give place to better arrangements. Yet they have helped us much to get into a position where they are no longer required. They were "stepping-stones to higher things."

Few people in the colony take any interest in its literature. In our library we have a fair collection which, when carefully studied, helps us to get a real picture of former conditions and to find out the antecedents of what we have to-day. Much interest can be felt in tracing the beginnings of things as they are and their gradual development. However slow the progress it has been real, but we need not boast too much or think ourselves so *very superior* to our ancestors. If we had lived in their day we should have probably acted as they did. Some of their doings appear wrong in our eyes, but as we can only judge by results, we have to say that there was never any real evil. The great fault of the world in general is the putting up of standards of right and wrong which are only valid for a time. We should go forward and never try to get back, throw over all fixed standards, and take the lessons of the past to heart. Old laws have to be changed as we progress and we must remember that the question, "What is truth?" is still unanswered. The truths of to-day must be modified to-morrow; we can hold them, but only tentatively.

The lines of historical study for our colony may be formulated in a tentative way as follows:—

First.—It is necessary for the historian to know the country so as to understand what the people were like at different times. We are all creatures of circumstances and must study the surroundings that once developed the native Indian, then the negro and lastly the East Indians, Chinese and coloured people. It has been stated that, given particular circumstances and peoples nothing different could be possible. People, we can see to-day tell us plainly something of their ancestors—as for the country it is practically the same. It follows therefore that with our knowledge of the present we can get a fair idea of the past with the assistance of the early voyagers. Every traveller must be consulted by the historian who however must correct their statements by his advanced scientific knowledge.

Second:—In connection with what he gathers from the earliest travellers he should find out how and when certain plants were introduced. For example cotton and tobacco were found here but coffee and the sugar-cane were brought by white men. The whole plantation system was based on sugar, coffee and cotton and therefore these products must be considered by every historian. Here also we have to take accounts of the fact that Dutchmen were accustomed to empolder land and that East Indians were adepts at rice growing.

Some will say this is not history and yet it cannot be ignored. It is a curious fact that whereas we have our coastlands empoldered, Surinam has done hardly anything in the same way. The fact appears to be that as Surinam was British at first its development was not on Dutch lines. If the historian is to deal with the origins of things as they are he cannot afford to ignore racial and national habits and customs. Those who simply deal with events and exclude everything else will never understand the why and wherefore of things. Local conditions mean much and often give us the keys to problems otherwise insoluble.

Again, every historian should know something of the mother countries when writing of colonies. For many years professed historians have stated that the *Dutch* settled in Pomeroon in 1580. As a nation there were no Dutch at that time for the Netherlands did not revolt before 1581 and there was a long period of unrest before we may consider the Seven Provinces as a nation. *Flemings*, while under the same rule, went to America as Spaniards; if therefore they were in the Pomeroon in 1580 they could not represent the Dutch Republic. Blunders can be found in all the professed histories of Guiana and though I will not mention names I may make the general statement without claiming for myself anything like infallibility. Everything we do is open to improvement and if we make mistakes it simply means that they should be rectified by ourselves or others. The true historian does not want to put up his judgments as final.

The first-hand materials for Guiana history are the Records of the West India Company in Holland and the Colonial Records here. Netscher worked with the first and then came the work of the Boundary Commission, followed by Gravesande's letters. A few books such as that of Van Berkel, who lived in Berbice, are useful, but compilations like that of Hartsink must be considered as not quite reliable. The Dutch period is represented by few books of travel, but there is a work of the utmost importance in trying to get right views of the condition of the planters; this is the "*Letters of Aristodemus and Sincerus*." The letters and appendices give us the views of the colonists and we can compare them with the official documents, always remembering however that both are biassed and from different standpoints.

When we come to the British period we have a fair number of travellers, fuller records, and at last newspapers. In connection with the labour problem there were Parliamentary Committees and Commissions of Enquiry all of which are of great importance. The later the document or book the more reliable it is, but nothing whatever should be taken as absolutely correct. To check party statements we can find in newspapers of the last century a wealth of information in the advertisements.

There is an important side of history, that of families. Memories of old people are useful when we can check them from other sources, but the people themselves have to be studied. Much can be gathered from wills and there are legal documents and the reports of law cases. Even tombs with inscriptions sometimes help. In other countries old buildings and even ruins have their stories but here there is not much to be gathered from our mostly wooden structures. Pictures come in and for recent years we have photos.

An important mass of evidence can be got by the naturalist from plants and especially old trees. Here in town we have cabbage palms in clumps and a short avenue at the east of the Brick Dam. Some of these are a century old and either point out the sites of buildings or burying places. An old fruit-tree means that the site was occupied by people long

ago and we can often find such relics in what is now a jungle. If certain foreign plants can be found we are sure that there was once a clearing on the spot. I have seen an old brick chimney smothered in bush and yet could be sure that there was once a sugar factory on the spot. A real historian ignores nothing for very simple things help to solve important questions, and to give him a picture of the past with a suitable background.

As few people are acquainted with the materials for a history of Guiana I have thought it desirable to give a few examples from the older English writers. Two books are of the first importance, Raleigh's "Discoverie" and Waterton's "Wanderings"; they have been considered as belonging to the World's literature and have been published in many editions in English and other languages. Both writers may be thought important from many standpoints but at present I can do no more than pick out something that appears characteristic. Raleigh lived in an age when little was thought of the picturesque and yet the following extract shows his appreciation of scenery:—

"On both sides of this river we passed the most beautiful country that ever mine eyes beheld; and whereas all that we had seen before was nothing but woods, prickles, bushes and thorns, here we beheld plains of twenty miles in length, the grass short and green, and in divers parts groves of trees by themselves, as if they had been by all the art and labour in the world so made of purpose; and still as we rowed the deer came down feeding by the water side, as if they had been used to a keeper's call."

Raleigh got a good name among our Indians which appears to have been retained as a tradition for over a century:—"We espied a small canoe with three Indians, which, by the swiftness of my barge, rowing with eight oars, I overtook ere they could cross the river; the rest of the people on the banks, shadowed under the thick wood, gazed on with a doubtful conceit what might befall those three which we had taken. But when they perceived that that we offered them no violence, neither entered their canoe with any of ours, nor took out of the canoe any of theirs, they then began to show themselves on the bank's side, and offered to traffic with us for such things as they had, and as we drew near they all stayed, and we came with our barge to the mouth of a little creek, which came from their town into the great river."

Charles Waterton was a most genial writer for he treated his readers as confidential friends. As a true naturalist he tries to make us see and hear what he distinguished in the forest and on the river.

"Courteous reader, here thou hast the outlines of an amazing landscape given thee; thou wilt see that the principal parts of it are but faintly traced, some of them scarcely visible at all, and that the shades are wholly wanting. If thy soul partakes of the ardent flame which the persevering Mungo Park's did, these outlines will be enough for thee: they will give thee some idea of what a noble country this is; and if thou

hast but courage to set about giving the world a finished picture of it, neither materials to work on, nor colours to paint it in its true shades will be wanting in thee."

This quaint style enables us to have full sympathy with the writer, and every true naturalist feels himself in harmony with his genial mind. We can be sure that as a planter in charge of slaves he never could have been anything but the kind Massa so often pictured by visitors to the colony. This idea is justified by his own words:—

"Slavery can never be defended; he whose heart is not of iron can never wish to be able to defend it; while he heaves a sigh for the poor negro in captivity, he wishes from his soul that the traffic had been stifled in its birth; . . . now . . . the situation of the plantation slaves is depicted as truly deplorable and their condition wretched. It is not so. A Briton's heart, proverbially kind and generous, is not changed by climate, or its streams of compassion dried up by the scorching heat of a Demerara sun; he cheers his negroes in labour, comforts them in sickness, is kind to them in old age, and never forgets that they are his fellow-creatures."

Although I have given due prominence to Raleigh and Waterton, it is not to be supposed that they are the only writers on Guiana. there were Dutch and French authors of some note, but I can only find space to touch on the principal English books. Dr. Bancroft lived in Demerara about 1760 and wrote an "Essay on the Natural History of Guiana" which is useful but almost entirely descriptive. His account of the Indians is interesting but I can only quote a paragraph:—

"The simplicity of the lives of these people, the paucity of their wants, and the ease with which they are supplied, in a country so happily situated, and so liberally endowed with the necessaries of life, leaves the greater part of their time unoccupied with the cares of procuring sustenance, in which they have ample leisure to pursue the various modes of amusement and pleasure, which are most agreeable to their simple rustic inclinations: A part of these idle hours they pass in bathing and swimming in the rivers, which they do in companies, without distinction of sex several times a day: and they are so constant and expert at swimming, that they almost deserve to be classed with amphibious animals; this they find not only an agreeable but salubrious exercise, as it tends to repress excessive perspiration and preserve health. At other times they visit each other, and are mutually entertained, not only with the simple occurrences of their lives, but with a variety of fables, which are merry, significant and replete with such simple morality, as their confined observations and uncultivated minds have suggested. On these occasions they often abandon themselves to puerile mirth, dancing, or immoderate laughter; but harmony and good humour ever prevail, until they are intoxicated by drink."

Dr. Pinckard's *Notes on the West Indies* is of much interest to the historian and readable as well. He came with the fleet that took over the

Dutch colonies in 1796 and gave a chatty account of what he saw and experienced in the form of letters. Here is his account of Vlissingen before any leases had been given for building purposes. The middle walk of the plantation is now Regent street.

"I have made a visit to a coffee plantation near the town, where I saw an extensive display of the luxuriancy of the soil of Guiana. This estate differs from the wide fields upon the coast: only in being a flat surface of coffee, instead of cotton; but is rendered rich and inviting, from being traversed with green walks, shaded with fine rows of trees, whose loaded branches bend under the various species of tropical fruits, serving at the same time to delight the eye, regale the olfactories and refresh the palate. A pleasant path, more than a mile in length, and of sufficient width for carriages, leads down the middle of the estate, the sides being decorated with mangoes, oranges, Avigata pears, and many other kinds of fruit."

Dr. Pinckard was very impartial and could give the dark side of the plantation system, but he does not fail to praise it in some cases. His account of Pln. Profit, now part of Providence, shows well the bright side:—

"The slaves of Mr. Dougan are not only fed and clothed, and tenderly watched in sickness, without any personal thought or concern; but each has his appropriate spot of ground and his cottage, in which he feels a right as sacred as if secured to him by all the seals and parchments of the Lord High Chancellor of England and his Court!"

Bolingbroke's "Voyage to Demerary," 1807, is interesting but not very reliable; his account of the systems of fees so common when officials had small salaries is interesting:—

"All official documents and colonial papers pass through the Governor's office, and for every time he signs his name, his *private* secretary receives two dollars, for which he no doubt accounts to the principal. Evidences given before the courts of justice are in the form of affidavits, which must be made before His Excellency. Passports for people leaving the country, permissions for ships to load or discharge, powers of attorney, and various other papers of a similar tendency, must undergo his signature; thus besides suffering a previous tax from the office, out of which they are first granted, they are burthened by paying for the Governor's signature. No wonder our West Indian Governors grow rich, when they have such opportunities."

"Those who approach the altar of hymen, are principally people of colour, who in conformity with the laws, are obliged to receive permission from this ecclesiastical court, for which they pay the extravagant fee of one hundred and ten guilders. . . . An English gentleman who was on the eve of marrying a Dutch lady, attempted to break through this law, and intended to be married according to the established form of the Church of England; when the vice-president of the court, fearing he

should lose his fees, very charitably informed him that if he deviated in the least from the established rule, he would publish throughout the colony their living in a state of incontinency, and the illegality of the marriage."

Stedman's "Narrative," 1796, is an account of expeditions against Bush Negroes in Surinam and gives a lurid picture of slavery. His own sufferings probably made him look at the dark side, but he had to admit that it was not all bad.

"The national character of these people, as I have remarked it where they are as free to act by their own will and disposition as in Africa, is perfectly savage: the twenty thousand Ouca and Seramica free negroes have lived separated, and under no control of Europeans, for a number of years, and yet I have never seen any marks of civilization, order or government among them, but, on the contrary, many examples of ungovernable passion, debauchery and indolence."

His account of a sale of newly-imported slaves is interesting but too long for quoting more than this:—

"A new name is given to the newly-bought slave and he or she is delivered to an old one of the same sex, and sent to the estates, where each is properly kept clean by his guardian, instructed and well fed, without working for the space of six weeks; during which period, from living skeletons, they become plump and fat, with a beautiful clean skin, till it is disfigured by some rascally proprietor, or rather his overseer."

He gives an account of the narrow escape of an overseer when the plantation was raided by Bush Negroes:—

"The rebels, Sir," said he, "had already surrounded the dwelling-house in which I was, before I knew of their being in the plantation, and were employed in setting fire to the four corners of it so that to run out of it was rushing on certain death. In this dilemma I fled to the garret, where I laid myself flat on one of the beams, in hopes of their dispersing soon, and that I might effect my escape before the building should be burnt down; but in this I was disappointed, as they still remained; and at the same time the flames increased so fast that the heat became insupportable in the place where I was, and I had no other alternative left, than to be burnt to death, or to leap from a high garret window into the midst of my exasperated enemies. This last measure, however, I resolved upon, and had not only the good fortune to light unhurt upon my feet, but to escape without a wound, from among so many men armed with sabres and bill-hooks. I flew to the water-side, into which I plunged headlong; however, not being able to swim, I immediately sunk to the bottom, but I still kept my presence of mind, and while they concluded me to be drowned, found means by the help of the *moco-moco* and mangrove roots, to bring myself not only under cover of the impending verdure, but just so far above water with my lips as to continue in a state of respiration till all was over. Having killed every other person, the rebels departed and I was taken up by a boat from my very perilous situation."

Baron von Sack's "Narrative of a Voyage to Surinam," 1810, is interesting as a picture of Surinam under British rule and of the dangers from privateers; here is part of his account of a capture, it may be noted that some courtesy was shown:—

"The Jason had been firing for near half-an-hour when one of the privateers came close to our windward side and the crew called out *à la bord!* They could board easily by the cabin windows, which were not sufficiently defended, I went therefore on deck to speak to the captain about this circumstance; I found him still commanding, but the crew were retreating from their guns, whilst the musket balls were whistling over their heads. The privateer had a great number of men, who seemed all prepared for boarding the Jason. I had only time to go down and get my passport, and put my luggage in order, when Captain M. called to me that he had been obliged to surrender; he was followed by two officers of the privateer, to whom I delivered my passport, with the declaration, that all which I had with me were not mercantile goods but only for my own private use: they assured me that as I belonged to a neutral nation I should enjoy the greatest favour. Captain M. now saw the cargo of his ship taken possession of, and all his trunks carefully examined, and with tears in his eyes he said to me, "There you see now, sir, how the hard-earned labour of we masters of ships goes; this is the sixth time I have been taken by privateers, and all my endeavours to gain something for my advanced age, and for the comfort of my family, is in vain!"

A century ago there were several men who took much interest in the welfare of the colony though they did not write any important books. Drs. Hancock and Fraser with Mr. Hilhouse formed a trio who collectively knew as much of the interior as any one to-day. Hancock wrote some "Observations" in favour of British Guiana as a field for colonization in which he thus speaks of the absence of phthisis:—

"I have long been of opinion that the exemption from phthisis on the coast of Guiana is partly owing to the gaseous emanations from the soil; but I have reason to believe that the main cause is referable to the free perspiration experienced here, together with the almost total absence of those chilling blasts which are common in other tropical regions."

It was probably true that consumption was unknown here about fifty years ago, but we have to dismiss Dr. Hancock's reasons for its absence, and deplore the fact that it has arrived in spite of gases and perspiration! In another place Hancock says:—

"The climate, I may say, is not only prophylactic, but curative of this disorder (pulmonary consumption) of which I have known various instances: and one of the most remarkable and desperate cases occurred so long ago as 1806, in the harbour of Demerara, in the person of a Swede, who arrived in a vessel from Portsmouth."

I heard similar stories when I arrived in the colony, and it is quite certain that people believed in them whether true or not. The evidence points to the introduction of the disease during the last forty years.

Mr. William Hilhouse wrote a number of articles for the local papers and three were published in the *Journal of the Royal Geographical Society*.

From his "Notices of the Indians" in Vol. 2 of the *Journal* I extract the following :—

"Their most valuable qualities are agility, dexterity, and the intuitive tact of tracking or discovering footsteps in the bush. Where an European can discover no indication whatever, an Indian will point out the footsteps of any number of negroes, and will state the precise day on which they have passed ; and if on the same day will state the hour."

"The duties of hospitality are paramount with all barbarous nations. When a stranger, and particularly an European, enters into the house of an Indian, everything is at his command . . . This is exceedingly inconvenient in the sequel because all offices of kindness are supposed to be reciprocal. When the Indian pays the white man a visit, the difference in value of his furniture and equipments cause a return in kind to be too expensive. The Indian therefore says, "When you visit me, I give you everything I have in the world—but when I visit you, you refuse me the commonest articles of your daily expenditure."

The writings of the Schomburgks were mostly in German, but the reports of Sir Robert to the Royal Geographical Society are in English and of much importance. I cannot give anything like an idea of their work from a mere quotation but only pick out something from each. Sir Robert's account of finding Victoria regia in the Berbice River has often been quoted but it is so characteristic that it will bear repetition :—

"Some object on the southern point of the basin attracted my attention ; I could not form any idea of what it might be, and I hurried the crew to increase the rate of their paddling ; in a short time we were opposite the object of our curiosity—a vegetable wonder ! All calamities were forgotten ; I felt as a botanist and felt myself rewarded. A gigantic leaf, from five to six feet in diameter, salver-shaped, with a broad rim of light green above and a vivid crimson below, rested upon the water : quite in character with this wonderful leaf was the luxuriant flower, consisting of many hundred petals, passing in alternate tints from pure white to rose and pink. The smooth water was covered with them and I rowed from one to the other, observing always something new to be admired."

Dr. Richard Schomburgk wrote in his "Botanical reminiscences" of the lovely flower garden at the base of the Roraima cliffs and thus speaks of his feelings :—

"I was lost in admiration looking up to the gigantic wall, the summit of which projected a little ; my heart began to beat as if I apprehended danger, and a wish to escape from it. An oppressive solitude prevailed ;

there was not a sign of life, only the noise of the falling water was heard. Looking up to the giddy height, the mass of rock before me appeared wild and dreadful; round about large blocks of rock were scattered in demon-like confusion, which had been precipitated from the summit and steep declivity, the surrounding trees among which they fell being shattered into fragments. The grandeur and the sublimity of the gigantic mass of this marvel of nature, created the continued sensation that the projecting summit would fall suddenly and bury me under its ruins, and called forth a feeling quite heavy and strange to me."

Captain Alexander visited the colony in 1831 and gave his observations in "Transatlantic Sketches;" the work is not very reliable but what he actually saw may be taken as correct. His views of slavery were not antagonistic but of course he only saw what was obvious. Here is his account of the slaves in Georgetown:—

"The men were well clothed and well fed; hats or striped caps they wore on their heads; and though they prefer carrying their jacket under their arm to wearing it on their shoulders, and strip to their work to the trousers yet they all seemed to be abundantly supplied with clothes. The negresses were decently clad in printed gowns, and were commonly seen walking about huckstering vegetables, carried in a wooden tray on their heads. There were no sounds but those of merriment; the song and chorus of a group of young negresses, the salutations and jokes of friends meeting, and the incessant gabbling of the old women, who when they can get no one to converse with, carry on a conversation (aloud) with their own sweet selves, like negroes at their balls, sometimes dancing to their own shadow on the wall for want of a partner."

Lieut.-Col. Capadose in his "Sixteen Years in the West Indies," published 1845, has a chapter on British Guiana from which little can be gathered, but it may be interesting to note that the first Royal Mail Steamer came on the 12th January, 1842.

"The twelfth was a day of great excitement in Georgetown, an excitement caused by the arrival, for the first time, of one of the Royal Mail Steam Company's Packets. The Clyde was crowded with visitors during its stay, amongst whom was the Governor, his lady and family."

One of the most useful books for any one who wants to study the results of emancipation is "Eight Years in British Guiana by "Barton Premium," 1850. The writer evidently knew a great deal about the labour problem and his views are worthy of careful consideration. Here is a fragment:—

"Massa," said the youth, "we no want estate to hab caracter?" "Indeed," was my reply; "I should think it is what you care very little about; it is notorious that all of you now do the plantation work very badly; if you wish your own to have a good character, why don't you do it as well as in the old time?" "O dat is oder ting" "Why?" He would not answer, but I could do it for him. Individually, they like to

indulge their indolence by doing their task, in the laziest and consequently, in the worst manner; but they are all proud, and each would like to see his comrade doing the work properly, although he will not, because he wishes, in speaking to a friend on a neighbouring estate, to be able to crow over him, and to tell that his cultivation looks better, and his crops are larger than those of his neighbour. It has often struck me that the negro is the proudest of mankind, and the most sensitive in regard to aggression on his self-esteem."

The Rev. Robert Duff, a presbyterian, wrote "British Guiana, being Notes on a few Natural Productions, etc.," 1866. There is a great deal of undigested information in the book and it is hard to find a characteristic paragraph, but the following will be useful to compare with the accounts of missionary books where much is made of dangers that do not really exist:—

"Much has been written on the hardships of a missionary life, and it is true there is sometimes a good deal of fatigue to be borne which many do not like. But so far as my experience goes the weeks spent in visiting the Indiana, Christianburgh, Camoeny and Baracara missions have always been looked forward to as holidays, and enjoyed with pleasure and delight. Irrespective of the benefit and pleasure conferred on the people, and their consequent gratitude and anxiety to show it in every way they can, by watching to learn one's wishes and ministering to their gratification, so far as is in their power, there is a variety and excitement, which in the somewhat monotonous life of a minister, gives a charm to missionary operations which no other ministerial work possesses."

The Rev. W. H. Brett wrote several works on Indians and Missions; they are very useful but hardly scientific. Here is an extract from "The Indian Tribes of Guiana":—

"Notwithstanding the indolence and apathy with which the Indians are charged, they are *keen observers of natural objects* though utterly unacquainted with scientific rules, their knowledge of medicinal and poisonous plants shows that their race must have studied the properties of the vegetable kingdom. They are also perfectly acquainted with the habits of the animals, birds, reptiles and insects which inhabit their country, and will sometimes point out facts connected with them which are little known save to professed naturalists."

"An accurate knowledge of the nature and habits of wild animals is indispensable to men whose subsistence is in a great measure derived from the chase. The Indian hunter possesses it in perfection. He will exactly imitate the cry of various birds and animals, and shoot them when he has thus brought them within reach of his gun, arrow or blow-pipe."

Another missionary was the Rev. C. D. Dance whose "Log-Book" is full of first-hand observations, but unfortunately without arrangement. It is a great loss to science that a good observer should not have made

better use of his opportunities. Even as it is however we could not afford to lose it. The first extract I give refers to the Great Falls of the Demerara :—

“If one can imagine a wall of irresistible water heavily falling into huge caldrons of from thirty to sixty feet in circumference, boiling, bubbling up and furiously running around, descending and ascending, all helter-skelter,—the perfection of powerful, confused motion,—a chaos of raging water,—the very granite yielding to the attritive force, and forming wells ;—such an one will have an approximate idea of the waters immediately above the lowest part of the falls.”

Many interesting bits of folk-lore may be found, all of which are decidedly interesting, but I have not room for one of the longer stories. Here is something about the Piaiman :—

“I knew a woodcutter that once had a company of five Indians working with him for a time on his ‘grant,’ they had brought with them an old man who was past working, but was useful in telling them where game was to be found. They consulted him only in times of doubt or scarcity of the game. ‘Go,’ said he one day to the hunters, ‘to such a spot,’ indicating the spot, ‘and you will find a herd of abuias’ (wild hogs, *Dicotyles labiatus*). They went and brought home fifteen. On another occasion he was asked to say where the wiri-biciri deer, so esteemed for the delicacy of its venison could be procured. Early in the morning he gave the men the directions, and they returned with two of the required deer. Sometimes he would say that the game was too far away ; and at other times he told them not to go out hunting at all on that day, even if they were on short commons, for that ‘bad would come’—meaning that some accident would occur.”

One of the most readable books of travel is Anthony Trollope’s “West Indies and Spanish Main.” He was here on Post Office business for a few weeks and gave only his impressions. He has been often quoted but the following is not so hackneyed as some others :—

“I went over the hospital with the doctor there; for even in Demerara they required a hospital for the negroes. ‘And what is the prevailing disease of the colony?’ I asked him. ‘Dropsy with the black men,’ he answered, ‘and brandy with the white.’

“‘You don’t think much of yellow fever?’ I asked him.

“‘No; very little. It comes once in six or seven years; and like influenza or cholera at home, it requires its victims. What is that to consumption, whose visits with you are constant, who daily demands its hecatombs? We don’t like yellow fever certainly; but yellow fever is not half so bad a fellow as the brandy bottle.’”

Chester’s “Transatlantic Sketches,” 1869, is a chatty book of the same type as Trollope’s but not of much value; here is an extract :—

“The Anglo-Demerarian population enjoy a well-merited reputation for hospitality, and in point of civilization are far ahead of the stagnant

people of the West Indies. Like their predecessors, the old Dutch settlers, they have had great obstacles to contend with, and have battled bravely with them, and in the main successfully. The waters of the sea and rivers are only kept out by a great expenditure of labour. Quite recently a long strip of coast just beyond the Fort, at Georgetown, has been swept away. The breach is being repaired mainly by convict labour."

Brown and Sawkins' Geological Survey and Brown's 'Canoe and Camp Life,' 1876, are very important. The latter is a readable book from which I extract the following account of the discovery of the Kaieteur Fall:—

"When we came to the northern end of the savanna I observed that heavy masses of vapour were drifting before the north-east wind, making the trees, grass, and shrubs on our right dripping wet. This came from the great fall to which we were in close proximity, but which was hidden from view by a grove of trees. Making a detour to the right through this grove we came out on the flat rocks at the head of the great fall, and walking to the edge of the precipice, down which the water was precipitated, I gazed with wonder and delight at the singular and magnificent sight that lay before me. Not being prepared for anything so grand and startling I could not at first believe my eyes, but felt that it was all a dream."

"Standing on the edge of the water near the brink I looked down a long and comparatively straight valley, bounded by wooded bluffs and cliffs; with precipices of gray sandstone rock in places. In the bottom of this valley curves of the river, in its onward course from the foot of the fall, could be seen, the distant ones resembling little streaks of silver. Beyond the mouth of the valley lay a great wooded plain, stretching away to the horizon northward."

Mr. J. W. Boddam-Whetham gave the results of an attempt to scale Roraima in his book "Roraima and British Guiana," 1879. He went with Mr. M. McTurk prepared with ropes and other necessities to climb the great rock, but they failed.

"Gradually the conviction was forced upon us that the Indians were right, and that Roraima was impregnable."

"As daylight faded, the mountain fortress loomed more and more mysterious; the battlements were touched with a light rose colour, and the clear-cut summit was sharply defined against the purple sky. For a short time the mists rolled away, and this great 'sermon in stone' stood out in vivid faultless accuracy, all the more impressive from the perfect stillness of the scene, then darkness fell; but presently the moon arose, and lo! the recent rich colouring gave place to a fretwork of pure frosted silver. The edges of the woods and the pencilled lines of the delicate foliage were burnished with the soft rays, and then, indeed, Roraima looked weird and solemn."

The mysterious rock was ascended later by Mr. im Thurn, and since he found the way by a number of others. Before he did this however he wrote "Among the Indians of Guiana," 1883, an important contribution to Guiana literature. He did not probably anticipate his future achievement when he wrote:—

"The task would take a very considerable and indefinite time."

As a matter of fact he hit upon the slope without taking such pains as Messrs. Boddam-Whetham and McTurk. As a specimen of im Thurn's book I quote the following:—

"The use of beenas is very curious. The avowed purpose is, as has been said, to ensure success. But the line of thought by which the hunter, mentally connects success in the acquisition of game with pain previously inflicted on himself or his dogs is not obvious. For such cases as those in which leaves and other parts of certain plants are rubbed into wounds on the noses of the dogs, it seems at first sight probable that this is done on the supposition that the power of scent in the dogs is thereby improved."

I do not go farther to quote the whole paragraph because our views of beenas have been much amplified by fuller knowledge, but give a little about "Timehri":

"The pictured rocks, which are certainly the most striking and mysterious of the antiquities of Guiana, are—and this has apparently never yet been pointed out—not all of one kind. In all cases various figures are rudely depicted on larger or smaller surfaces of rocks. Sometimes these figures are painted, though such cases are few and, as will be shown, of little moment; more generally they are graven on the rock, and these alone are of great importance. Rock sculptures may, again, be distinguished into two kinds, differing in the depth of incision, the apparent mode of execution, and, most important of all, the character of the figures represented."

Story-tellers have done little with Guiana, but romances dealing with the West Indies are numerous. Some stories by Matthew Barker ("The Old Sailor") are useful because he was here as editor of a newspaper at the time of the East Coast Insurrection. In one of these he tells us of a bush expedition under Dr. McTurk. In his "Tough Yarns" he gives a pathetic sketch of "Daddy Davy" who came begging in England on a cold winter's night. He was recognized by his old master as one who had apparently been left in Demerara free and happy.

The following is an extract which rings true to life; Daddy has just recognized his old massa:—

"My own massa! what for you give Davy him life? What for you give Davy him freedom? and now de poor nigger die for want! But no?" checking himself, "neber see the day for go dead, now me find my massa!" 'Confound the cold!' said my grandfather, thrusting his

thumb and forefinger to his eyes, 'how it makes one's eyes run ! William, my boy,' turning to me, 'fetch that pocket handkerchief off the sofa.'

"I immediately obeyed, and felt as if the cold had affected me too ; for I employed my grandfather's handkerchief two or three times to wipe the trickling drops from my face before I delivered it into his hands."

Later on Daddy spoke of "da old massa what sleep in da Werk-en-Rust" and a note is given stating that the name originated in Demerara but might mean any burying ground.

The stories of "The Old Sailor" showed local knowledge, but Harriet Martineau's "Demerara: A Tale" is full of blunders, proving that she knew nothing of the colony. The historian finds it difficult to picture every-day life in the "good old times" for want of stories by residents in the colony ; a few have appeared in late years but they deal with present conditions.

SOME FIGURES IN STRING FROM THE MAKUSHIS ON THE IRENG AND TAKUTU RIVERS.

REV. ALBAN ROBINSON, S.J.

Whether string fingers have an ethnological value or not, there can be no doubt of their intense fascination as proved by their world-wide distribution. In some places the cord used is made of twisted rawhide, in others of stringy bark or fibre, in others again of carefully plaited hair. The string used by civilised nations is wretched compared with the elaborate cords made and used by the so-called savage tribes and nations.

The figures described in this article were collected during the wet season (May to August) of 1917 when I was living at the Mission of St. Ignatius, Zariwa, on the banks of the Takutu. My sole companions in that lonely place were some eight Indian boys of the *Makushi* tribe, all of them blissfully free from any knowledge of the English language. On fine evenings they would spend hours running about on the smooth space in front of the house, all intent and keen on the rhythm and ceremonies of their tribal games and never losing sight of the work of the moment. When, however, the rains broke and the nights became long for us, the boys would squat round me while I sat at my ticky-ticky (as they named my typewriter). One night, when the machine was temporarily out of order I showed them a very simple trick with string (the one called "Fly on the Nose" and then my treasure was discovered. One boy took the string, and after a moment's thought, worked out the figure they call *Munatá*. Once they found that they could do something I was unable to do, one or other of them would come of an evening and show me some new figure or trick. They were greatly delighted at my attempts which almost always ended in failure. It was a long time before I came across a method for recording permanently the various intricate movements and consequently, many an evening was passed with cords and figures.

Generally speaking, the string figures of savage nations are more complicated than the Cat's-cradle of Europe and sometimes set forms of words are chanted or recited. The Makushis, however, never sing or recite any formula or story while working out the pattern as we do with our "Pound of Candles." Indeed the only case I found among them of even a series of figures is the sequence of *Ka-erán* and *Erépsa*. I tried myself to elicit any formula and afterwards attempted the same by means of a capable interpreter, but I never discovered anything beyond the names of the figures, though they never omitted the word *Erépsa* when performing that figure while occasionally they did not mention the names with other patterns.

The cord they use when by themselves was made of carefully twisted three-strand crowa fibre. The ends they tied with a rather large knot which seriously impeded the easy running of the string. The boys preferred

appropriating the cords which I made from whipcord. In uniting the ends, I used a long splice but when my strings began to disappear, I gave up the splicing which proved very tedious work on such small cords, especially as the boys never seriously tried to learn how to splice.

For ordinary practice with these string figures it is best to take a piece of soft string about six feet long and to tie the ends by what is called the Fisherman's knot, which is one of those every Boy Scout knows. When two cords are required for any figure (there are two such described in this paper) it is of advantage for display purposes to make use of different colours.

A few words about the nomenclature used in describing the figures will not be out of place here. When the cord is passed round any finger we have two strings passing from that finger and a loop on it. These strings are called the near or far one according as they are on the near or far side of the finger as we look at the hands when held facing one another with the palms inwards. The loops are called dorsal if on the back of the finger, thumb or wrist, and palmar if on the inner or palmar side. Thus we may have the cord passing round the back of the left middle finger and thence to the right hand. In this case, there is a left middle near string, a left middle far string and a left middle dorsal loop. When there are two loops on any finger, the one which is further from the root of the finger (distal) is called the upper loop and the other one the lower loop. As soon as a loop is transferred from one finger to another, it takes its name from the finger on to which it is transferred. The fingers are named:—index, middle, ring and little. Ordinarily the movements of both hands should be as far as possible simultaneous where similar movements are performed by both. It is important to note the order of the various manipulations with great accuracy, otherwise the figure will not come out. This is especially the case in the opening movements as illustrated in Figs. 1-4. Generally the palmar string must be taken up by the right hand and afterwards by the left and not *vice-versa* unless expressly stated.

Many string figures begin with what is known as "Opening A." This is the case with the figures which I have called *Ka-erán*, *Erépsa*, *Kitúbra*, *Awotinér*, *Wanamari-Yembér*, and *Yipíng* while two others, *Kapái-shankará* and *Kurá*, begin with the first position of Opening A. This First Position is shown in Fig. 1, where it will be seen that the cord passes across the palm of each hand and round the back of the thumb and little finger to the opposite hand. The next step in Opening A is to take upon the back of the right index the palmar string crossing the left hand and afterwards the right palmar string on the back of the left index. These two movements are shown in Figs. 2 and 3. On separating the hands, if we look at them from above, we get the pattern shown in Fig. 4.

For the benefit of those who are interested in string figure working and who may be acquainted with Dr. Haddon's system of describing them,

I subjoin the following list of equivalent terms of what may be called the Popular and Scientific methods :—

POPULAR.	SCIENTIFIC.
far	ulnar
near	radial
upper	distal
lower	proximal.

MUNATÁ (DOOR.)

- 1st. Place the left hand in the loop so as to form a dorsal loop on the left wrist. Pass the near string between the left thumb and index and pass the far string between the left middle and ring fingers. Bring both back between the left index and middle fingers.
- 2nd. Pass the far index string to form a little finger loop and then the near middle string to form a thumb loop.
- 3rd. Take up the index palmar loop on the back of the right index and the middle palmar loop on the back of the right middle finger. Stretch.
- 4th. With the right index and thumb take up the dorsal wrist loop and bring it over the fingers to form a palmar one. Stretch.
- 5th. Loosen the loops on the right fingers and place them on the corresponding fingers of the left hand. Bring the lower loops of the left index and middle fingers over to the palmar side.
- 6th. Insert the right index and middle fingers into the dorsal loops of the left index and middle fingers. Pull. Hold the right hand vertically over the left and we have the pattern illustrated in Fig. 5.

ARAUTA-MUTAYEBÈR (MONKEY'S JAWS.)

The 1st. and 2nd. movements are the same as the corresponding movements of *Munatá* described above.

- 3rd. Pass the right wrist through the long hanging loop from underneath so as to form a dorsal loop on the right wrist. This loop remains in the same position up to the end.
- 4th, 5th, 6th, 7th, are the same as the 3rd, 4th, 5th, and 6th, of *Munatá*. In other words, this figure is made in the same way as *Munatá* except that an extra movement is inserted. The finished pattern is held horizontally. There is an illustration of it in "Timehri," July, 1912, p. 122, "Baboon's Mouth."

MOROI (BIRD-SNARE).

This has all the movements of *Munatá* except that a second loop is formed on the left wrist at the beginning by passing the far string round by the near side and back to its position.

KA-ERÁN (A VISITOR).

1st. Opening A.

2nd. Transfer the right index loop to the left index finger.

Transfer the lower left index loop to the right index finger.
Stretch.

This is illustrated in Fig. 6 where it is to be noted that the twistings of the string are not the same as in the finished part of Opening A as shown in Fig. 4.

ERÉPSA (A PERSON SITTING).

1st. and 2nd. are as in *Ka-erán* above, of which *Erépsa* is only a sequence.

3rd. Slip off the loop from the right index finger and hold the right hand vertically over the left.

The Makushis call this "*Erépsa*" which, as stated in the title, means "a person sitting." Their idea of these two patterns is that in *Ka-erán* a visitor arrives and afterwards (in the second) sits down on one of their low stools which are ordinarily made from the crown of a tree so that the cut trunk forms the seat and three branches cut off short form the legs. The string pattern is shown in Fig. 7, and the stool itself in Fig. 8.

KAPAI-SHANKARÀ (PALM TREE).

1st. First Position.

2nd. Pass the far left little finger string between the left index and thumb, back round the thumb and then between the ring and little fingers and round the little finger.

Pass the far right little finger string between the right index and thumb, back round the thumb and then between the ring and little fingers and round the right little finger.

3rd. Pass the right index and middle fingers under the two left palmar crossing strings into the large palmar loops, *i.e.*, the right index near the left thumb and the right middle finger near the left little finger, and bring the loops up on the backs of the fingers. Stretch. On the backs of the left index and middle fingers bring up the corresponding loops that are on the right hand.

4th. Slip off from the thumbs the lower loops, that is to say the string that passes directly from one thumb to the other.

5th. Slip off from the little fingers the lower loops which are formed by the string just loosened. Stretch.

6th. Exchange the loops on the index and middle fingers on to the opposite hand putting those from the left hand on to the right and then those from the right on to the left. Stretch.

The hands should be held one vertically over the other. The pattern represents the branches, trunk and roots of a kind of palm tree. The figure is shown in Fig. 9.

MO (WORM).

- 1st. Pass the left hand through the loop so that the latter rests on the thumb.
- 2nd. Pass the right index between the palmar string and the root of the thumb and, catching the dorsal string, bring it to the palmar side. Twist the loop which is now on the right index, clockwise through half a circle and then place it on the left index finger.
- 3rd. Repeat this movement between the left index and middle fingers putting the loop on the left middle finger.
- 4th. Repeat between the middle and ring fingers putting the loop on the ring finger.
- 5th. Repeat again between the ring and little fingers and put the loop on the little finger.
- 6th. Release the thumb loop. Pull slowly on the palmar string and the "worm" moves away.

This trick is the same as the common "Mouse" probably the most widely spread trick of all the world. It is mentioned by Lutz in "Timehri," July, 1912, p. 127, where he says the Patamonas call it "Snake." But the fact that he makes the boy speak of it as "Warum" (worm?) indicates that the Patamonas and Makushis give it the same name. Their languages are akin and the Makushi word *Mo* means worm, while their word for snake is "*Erkuí*."

TOORER (COWFLY).

- 1st. Thumbs only in the loops.
- 2nd. Pass the right hand over the left from the near side and back under so as to form a double dorsal loop on the left wrist.
- 3rd. With the right thumb and right little finger take up the left double dorsal wrist loop on the near side, bending the left palm down in so doing. Slip the loop on to the right little finger inserting this latter from above. Bring the hands to their normal position and stretch. This will twist the strings that pass from the right little finger.
- 4th. With the left little finger pick up both right thumb strings and form a double loop round the left little finger.
- 5th. With the right index and thumb pick up the left dorsal wrist loops and bring them to the palmar side. Stretch. We have now a single loop on each thumb and a double one on each little finger, while all the strings are knotted in the middle.
- 6th. Drop the loops off the little fingers. These loops are the wings of the fly.

An attempt is made to catch the fly by clapping the hands together but on separating them he has gone as he almost always does in actual life.

Dr. Lutz found this trick amongst the Patamonas he had on the Kaieteur plateau and he describes it in "Timehri" of July, 1912, p. 126. The manner of performing it, is, however, slightly different. Dr. Lutz'

Patamona boy in the 2nd. movement twists the left hand. In the 3rd. he picks up the loop from below, *i.e.*, from the radial side which in this case is lower than the ulnar. Dr. Lutz gives it the generic name of "Fly" which he calls "*Toolik*." It remains to be seen whether the word which Dr. Lutz represents by "*Toolik*" means in Patamona "Fly" or "Cowfly." Its similarity to the Makushi word "*Toorér*" would seem to imply the latter. The Makushis have dropped the final "k" entirely from very many words. They even refuse to pronounce it in such Patamona words as *Tuk-eit*, *Amak-tuek*. The Patamonas put a final "k" on to the word *Kaieteur*. In both languages there seems to be little or no distinction made between "l" and "r" and both letters seem to be in a great measure interchangeable. Hence a word pronounced by a Patamona as "*Toolik*" might easily be pronounced by a Makushi as "*Toorér*" and both of them would say that they were uttering the same word.

KITÚBRA (WOODPECKER).

- 1st. Put the right leg through the circle of the string to form a loop on the back of the calf.
- 2nd. Bring the right string round the front and under the foot. We have now two dorsal strings and one frontal one.
- 3rd. In the bight that remains, form "Opening A" taking the left palmar string first (this is essential).
- 4th. Pass the foot through the index loops, release the loops on the index and little fingers and pull with the thumbs when the string will be released.

Sometimes in the 4th movement, both feet are passed through the index loops. In this case the string is transferred from one leg to the other. On occasions the Indians continue this game of moving the string from one leg to the other and back again. This would seem to be the true origin of the name they give the trick as the flitting of the woodpecker is very well represented.

AWOTINÉR (CUTTING THE THROAT.)

This trick is performed in the same manner as *Kitúbra* except that the 1st. movement is done round the neck by putting the string at the back of the neck, passing the right string round by the front and back again. In the 4th. movement the index loops are passed over the head. As far as I could make out the word "*Awotinér*" means "damaged or cut neck." I have, however, called it "Cutting the Throat" as being nearer our English idiom.

WANAMARÍ-YEMBER (LOOKING-GLASS FRAME).

This pretty pattern is formed from a variation of "Opening A."

- 1st. First Position.

2nd. Take up the left palmar string from below on the back of the right index and middle fingers so as to form a single loop back of both fingers.

Take up the right palmar string in a similar way.

3rd. Transfer the left thumb loop on to the left index finger and the left little finger loop on to the left middle finger. Transfer the right thumb and little finger loops in the same way on to the right index and middle fingers.

4th. Bring the loop that is on the left index and middle fingers above the loops on each of these fingers and then bring the latter loops on to the palmar side.

Perform a similar movement on the right hand side.

5th. Take a second cord in the teeth and make its loops hang down over the first cord very near to the fingers.

6th. Insert the index and middle fingers of both hands over the palmar strings of the second cord, into their own loops of the first cord, and, bending the hands downwards, draw the second cord through the loops which will slip off the fingers by the action of bending and drawing.

7th. Stretch the second cord and the other one remains on it. We have now the hands downwards and palmar loops on the index and middle fingers of each hand. These are the second cord.

8th. Place the loop that is on the right index on to the right toe and the loop on the right middle finger on to the left toe. Transfer the loop of the left middle finger on to the right index and stretch.

Sometimes a second person takes hold of the loops of the second cord instead of their being put on to the toes. This extremely pretty pattern is illustrated in Fig. 10.

The Makushis are very careful in certain uses of their words. For instance, when a mirror has been removed from its frame, that frame is no longer a "looking-glass frame" but "what was a looking-glass frame." This altered meaning is expressed by the suffix *-ber*. It occurs in another of the figures of this article—*Aráuta-Mutáyeber*. This means really "what was the jaws of a monkey."

When I first learnt this figure, the boy pointed to the frame of a mirror. I asked him if he meant the mirror itself and he took the glass out of its frame and showed me the latter. When I took another empty frame he shook his head. Some time later when Fr. Cary-Elwes had returned, I suggested that they could not have a Looking-glass Frame as both mirrors and frames were essentially products of civilisation. He told me, however, that the Makushis have both even in those districts where the Indians are still in their primitive conditions.

MOZÓI-YETÉ (SPIDER'S WEB).

This pattern, shown in Fig. 11, though called by the Indians by the name of hammock or spider's web, resembles more closely what is generally known as a Maltese cross (but without the re-entrant angles of the true Maltese cross.) Like the last pattern, it is done with two cords.

- 1st. Place a loop on the back of the left wrist. With the right hand take both strings and place them between the left index and middle fingers, bringing the near string round between the index and thumb and the far one round between middle and ring fingers of the left hand, at the same time inserting the right hand in the loose end of the long loop from above. Stretch. The right hand may be brought up either towards the body or away from it.
- 2nd. With the right index and middle fingers take up from underneath the two left palmar strings and bring them up on the backs of the fingers, taking care to pass between the hanging strings. Stretch. We have now one loop on each index and middle finger and one on each wrist.
- 3rd. Bring the wrist loops on to the palmar side. Stretch.
- 4th. Exchange the loops on the index and middle fingers on to the corresponding fingers of the other hand, passing those that were on the right hand over those that were on the left. Stretch.
- 5th. Place with the teeth another cord over the figure near the fingers and let the loops hang down back and front.
- 6th. Bend down the index and middle fingers of both hands over the palmar strings of the second cord into their own loops of the first cord and pull. By this action the second cord is held in the joints of the fingers and the first cord slips off them to the other.
- 7th. Place the right hand loops on to the toes and the left index loop on to the right hand. On pulling out the figure the finished pattern appears.

KAWÁK (GREEN PARROT).

- 1st. Pass a short loop between the index and middle fingers of the left hand leaving the long loop hanging down on the palmar side.
- 2nd. Bring the short loop over the left index and middle fingers so as to form a ring round each and a palmar string across the two.
- 3rd. Take up this palmar string and rotate the loop so formed through an angle of 180 degrees, making the rotation clockwise as you look at the left palm, and pass it over to the back of the left index and middle fingers. We have now a dorsal loop on each of the left index and middle fingers and a dorsal loop (superior) across both. On the palmar side there are two crossing strings.

- 4th. Separate the left index and middle fingers slightly. Pass the right index and thumb from above and take up between the strings the far string of the hanging loop. Pass this over the left little finger. Take up the near string in a similar way and pass it over the left thumb.
- 5th. Bring the dorsal loop that crosses both fingers on to the palmar side. Grip the long loop a few inches from the knots.

The parrot is made to fly by alternately closing and opening the thumb and little finger. This figure is illustrated in "Timehri," July, 1912, p. 118.

KURÁ (A SMALL FISH.)

This pretty pattern which is shown in Fig. 12, works out in a very regular way after an extremely irregular opening. In the finished figure there is the only example I have come across of a double bight of the cord forming an integral part of the pattern. This curious loop is seen towards the left of the illustration where the double strings meet. The short portion may, with a very little imagination, be considered as the mouth of the fish. The prototype of this figure is a very tiny fish about $2\frac{1}{2}$ inches long and $\frac{3}{4}$ inch broad.

1st. First Position.

- 2nd. Take up the left palmar string on the back of the right index finger.
- 3rd. Take up on the backs of the left index and middle fingers the two portions of the right palmar string that are on either side of the right far index string. Stretch.
- 4th. With the right middle finger take up the portion of the left palmar string that is below the left middle finger.
- 5th. Pass the thumbs over both index strings and over both middle strings and take up on the backs of the thumbs, the near little finger strings. Return the thumbs to their position.
- 6th. Pass the little fingers over the middle and index strings and take up on their backs, the far thumb strings. Return the little fingers to their position.
- 7th. Bending the index and middle fingers downwards insert each one into its own loop. In other words, bend these fingers down over the double palmar strings and on either side of the two strings passing between the index and middle fingers. Continue the downward movement of the hands and release the loops from the thumbs and little fingers.
- 8th. Still keeping the hands turned downwards, insert the thumbs into the loops held by the index finger and, freeing these, insert them into the middle finger loops, release the middle fingers and stretch smartly.

MAORAI (FISH-TRAP.)

- 1st. Put the left hand into the loop and hang this latter on the back of the wrist. Bring the far string round by the front and then by the back so as to form a double dorsal loop and a single palmar one on the left wrist.
- 2nd. Pass the long loop between the left index and middle fingers and back to the palmar side between the left middle and ring fingers.
- 3rd. Pass the right index underneath the two palmar loops from the near side and draw the long loop through. Pass one of the long hanging strings between the left index and thumb, round the thumb and on to the palmar side. The other string is passed between the left ring and little fingers, round the left little finger and so on to the palmar side.
- 4th. Take up on the backs of the right index and middle fingers the two short palmar loops now formed. Stretch.
- 5th. Loosen out the double dorsal loop on the left middle finger and passing the entire right hand through it, transfer it to the back of the right wrist.
- 6th. Transfer the right index and middle loops to the left index and middle fingers.
- 7th. Bring the left double wrist loop to the palmar side and stretch carefully, arranging the string just pulled over so as to form a binding round the other strings.

This figure is not at all a bad representation of an Indian fish-trap especially if the last movement is done with a certain amount of arrangement.

YIPING (MOUNTAIN.)

The Makushis give the name "*Yíping*" only to those mountains from which rivers take their source. Thus we have a river "*Náppi*" which rises in the *Náppi-Yíping* and the *Kára Kára* River rises similarly in the *Karákara-Yíping*. I believe they call other mountains by the generic name of "*Ter*" (stone.) At least, as far as I could make out, they always spoke of the various peaks of the *Kanaku* Mountain as "*Ter*" except where a river flowed down from one of them. This figure is described by Dr. Lutz in "*Timehri*," July, 1912, p. 121, but I think there are several points of difference between the two ways of manipulation.

- 1st. Opening A. Release the thumbs and stretch.
- 2nd. Take the left little finger loop and put it on the upper part of the left index in such a way that what was the far little finger string is now the upper near index string and what was the near little finger string now becomes the upper far index string. We have now two near index strings and on the far side we have a string passing

from the upper left index to the lower right index and, back of this, another string which passes from the upper right index to the lower left index.

- 3rd. Pass the thumbs over the lower near string, underneath the lower far string, over the upper near string and underneath the upper far string. Return the thumbs to their position.
- 4th. Pass the little fingers over the upper near index strings and take up on their backs from the far side the lower near index strings. Return the little fingers to their position.

We have now a palmar string on each hand running from the base of each index finger to a point about one third along the far little finger strings. This forms a triangle, on either side, of which the little finger on that side is the apex.

- 5th. Insert the index fingers into these triangles and take up on their backs the palmar string.
- 6th. Release the thumbs and stretch the figure making the palms face one another. This should be done smartly and a very fair representation of a mountain with a valley on either side will result as seen in Fig. 13.

KÚRU-ERÍ (A FISH).

This figure shown in Fig. 14, is described by Dr. Lutz in his article in "Timehri" but he calls it "River." I think he is wrong in this even though he says the Indians (Patamonas) laughed when he got an example of a dry river or a river in the dry season. The Makushi Indians call a river by the generic name of "*Túna*" (water). A very small creek is called "*Iwertér*." Other creeks have their own proper names and are always referred to by these names. The Makushis seem to have no words to distinguish between a river, a creek and water.

- 1st. Place both hands in the string so that there is a dorsal loop on each wrist.
- 2nd. Bring the far left string under the near one and pass it between the left ring and little fingers and back round the little finger. The strings from the right hand are now crossing near the centre.
- 3rd. Take up from the near side on the back of the right little finger, the vertical palmar string. Stretch.
- 4th. Lift the left wrist loop on to the left index finger and the right wrist loop on to the right index finger taking care not to twist them while so doing.
- 5th. Pass each thumb over the index strings and underneath the near little finger string and take up this latter on the back of each thumb. Return the thumbs to their position.
- 6th. Place on the top of each thumb that part of the index loop which is between the index and the thumb.

- 7th. Slip the lower thumb loops over to the palmar side. There is now a small triangle formed near each thumb by a string which comes from between the little and ring fingers, round the thumb loop and then to the opposite hand.
- 8th. Place the index fingers into these triangles and continue the movement of the hands turning them towards the body and down. At the same time release the little finger loops. Stretch the thumbs well out so as to form a broad pattern as seen in Fig. 14. It is very easy to spoil the pattern by neglect of this precaution and no amount of re-adjusting will improve a badly made one. The large diamonds on the pattern represent the scales of the fish.

PRÉTKU (TOAD.)

The pattern shown in Fig. 15 is quite different from the one which Dr. Lutz obtained at Kaieteur from Patamona Indians who live just forty miles from *Pua*, the village that my boy came from. The two patterns are similar in general outline but that is the only resemblance. In this one the head of the toad is towards the left while that of Dr. Lutz has the head in the other direction. The figure described by Dr. Lutz is extremely difficult to do from his description and, indeed on the only occasion that I succeeded in working it out, I am not at all sure that I followed his description exactly. If he describes the manipulation correctly, one can only say that he is very obscure; but I really think that he has made some mistake. In any case the manipulation in the two figures is totally different.

- 1st. Place the left wrist only in the loop. Pass the near string between the middle and index fingers and back between the index and thumb. Simultaneously with this movement, pass the far string between the middle and index and back between the middle and ring fingers.
- 2nd. Pass the far middle string between the thumb and index and back round the thumb. At the same time, pass the near index string between the ring and little fingers and back round the little finger.
- 3rd. Take up on the backs of the right index and middle fingers the two palmar loops just formed. Stretch.
- 4th. Bring the left wrist loop on to the palmar side.
- 5th. Transfer the right index and middle loops on to the left index and middle fingers. Bring the lower left index and middle loops on to the palmar side. Transfer the left index and middle loops to the right index and middle fingers. Stretch.

One cannot say how many of these string figures the Indians have, but the selection given above is only a very small portion of what we have in this colony of ours. All the figures described were obtained from Makushis and no attention was paid to the tricks of other tribes whether they resembled those of the Makushis or not. Reference has been made

several times to an article by Dr. Lutz in "Timehri" July, 1912. A number of the figures are the same as those described here but they were from Patamona Indians and not from Makushis. If in my descriptions I seem to have used his words, it has been done unwittingly. All the figures in the present article were worked out and noted down before I came across a copy of Dr. Lutz' figures and it was only after working laboriously through his descriptions that their resemblance to mine became apparent.

It may be interesting to note that it is not every Indian who knows how to work these patterns. They all seem to have some idea but only a few are proficient. Of the eighteen figures described, no less than eleven were shown me by one boy, Leonard by name. Another, Bernard, gave me three but he knew all or nearly all that Leonard did. Patricio gave me two, and Gabriel and Marco one each.

In a way, the string figures of the Indian tribes whether of North or South America are more interesting than are our own Cat's Cradle as they almost invariably require only one person while ours always demands the skill of at least two.

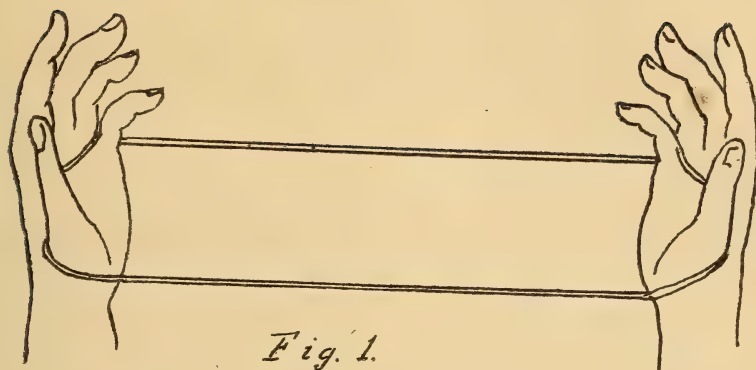


Fig. 1.



Fig. 2.



Fig. 3.

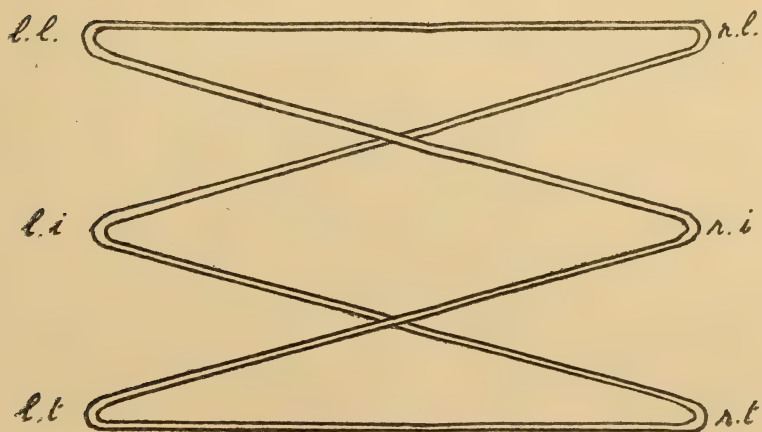


Fig. 4.

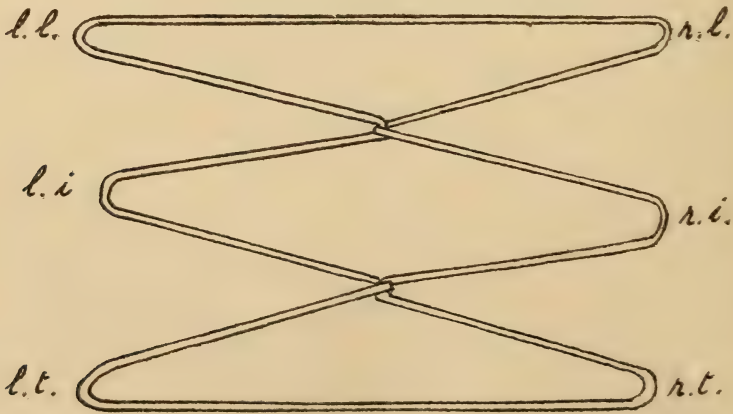
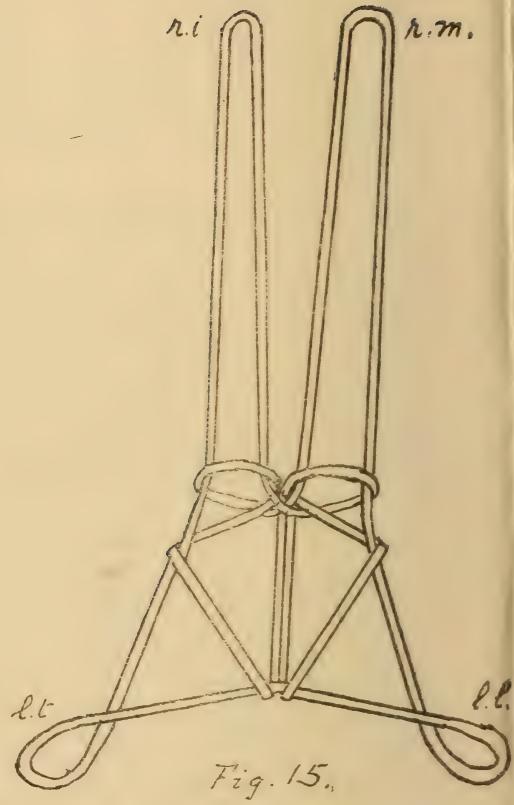
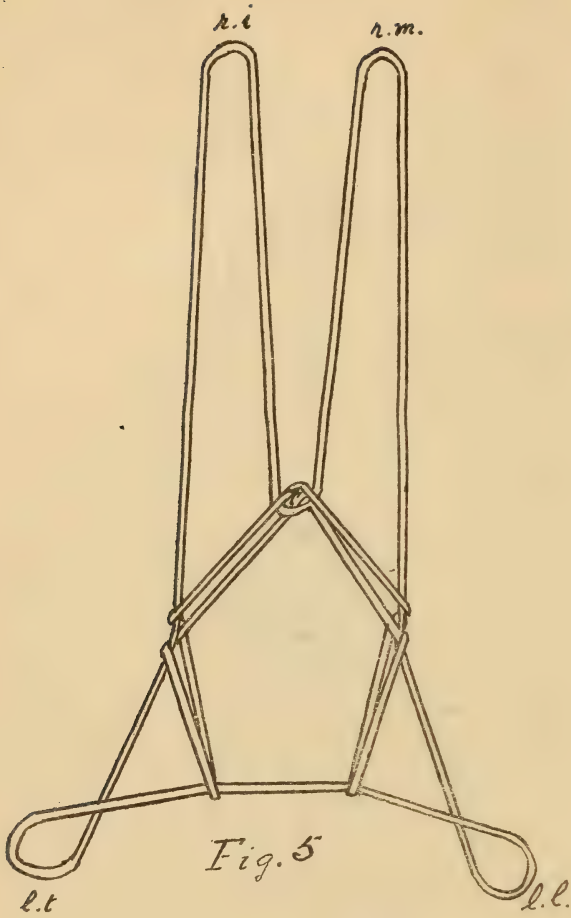


Fig. 6.

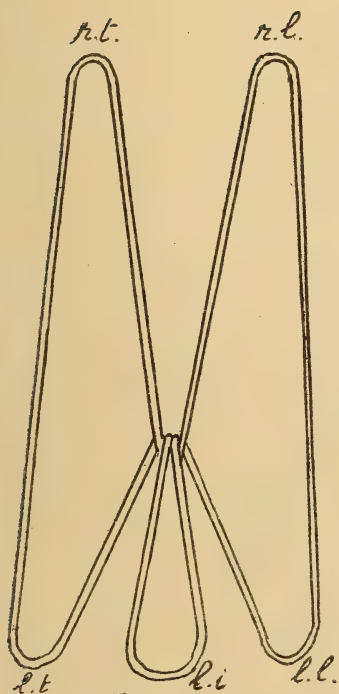


Fig. 7.

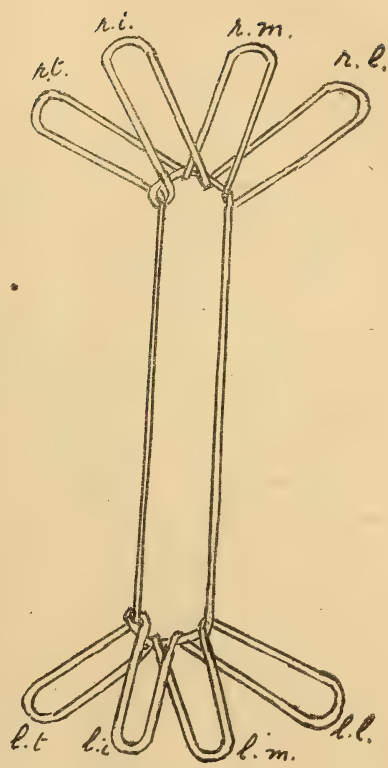


Fig. 9.



Fig. 8.

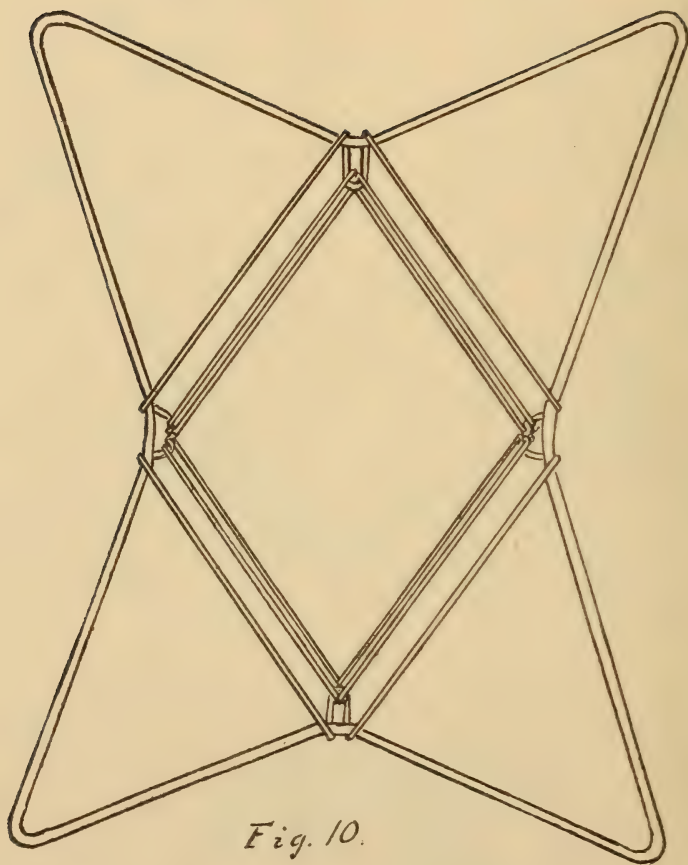


Fig. 10.

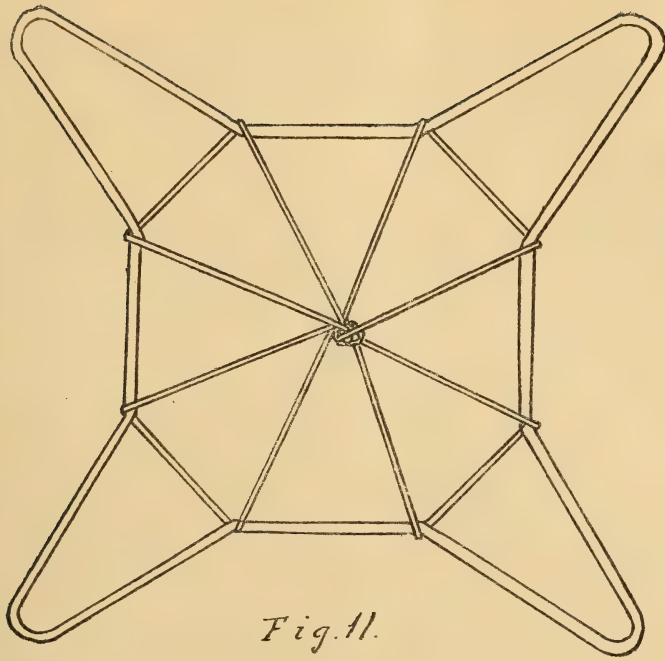


Fig. 11.

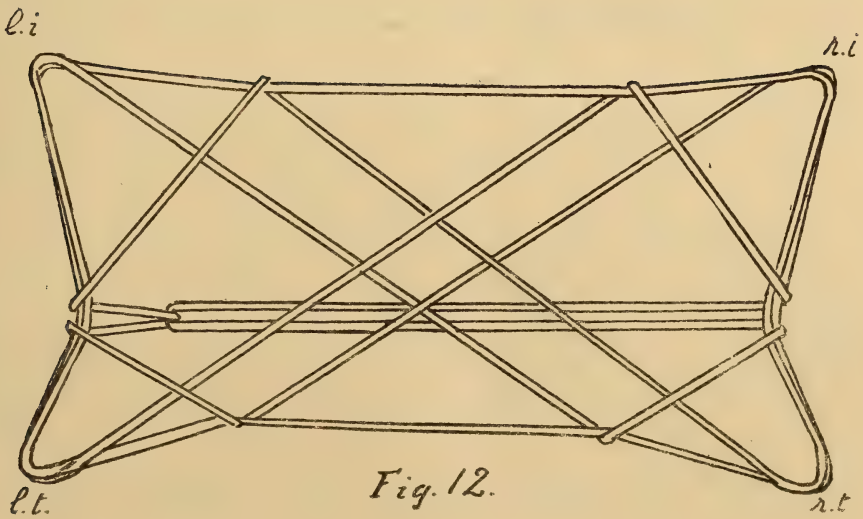
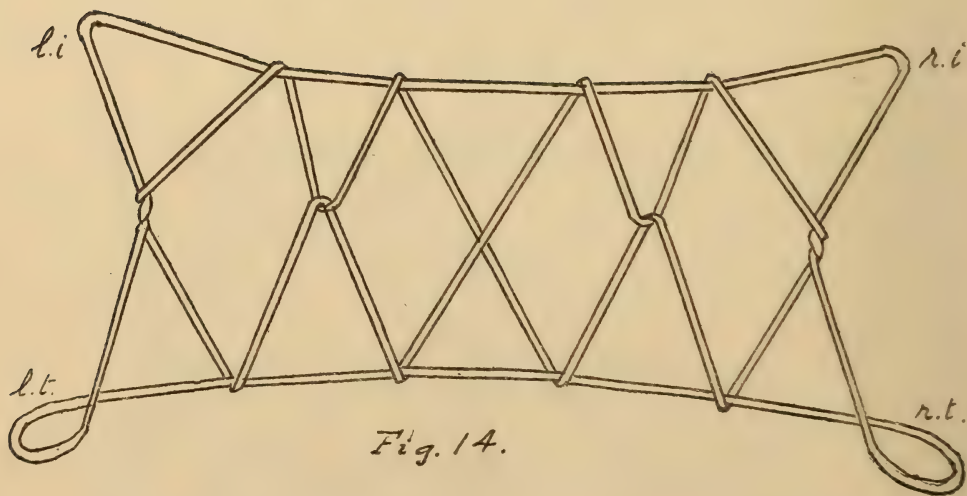
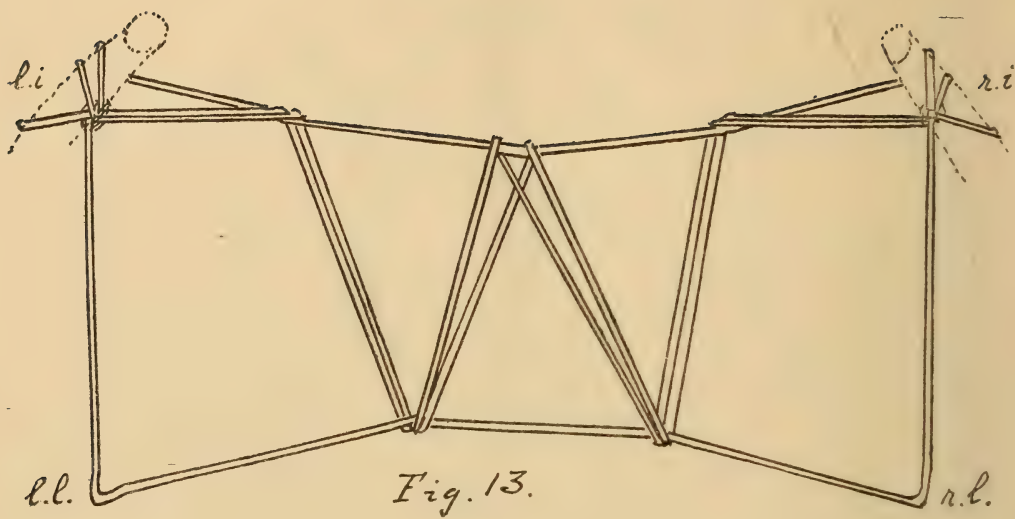


Fig. 12.



PRESENTATION TO DR. FERGUSON AND LECTURE BY DR. BEEBE.

OCTOBER 15TH 1917.

On the occasion of the lecture which was given by Dr. C. W. Beebe in the Reading Room of the Royal Agricultural and Commercial Society, His Excellency the Governor, Sir Wilfred Collet, K.C.M.G., presented to Dr. J. E. A. Ferguson the medal of the Davson Research Fund for 1917.

The fund was established about three years ago by the Davson Family as a memorial to the late Sir Henry Davson and the medal, which is a beautiful one made of gold, is to be awarded every three years through the local branch of the British Medical Association for the best work on medical research in the colony. Dr. Ferguson has done a large amount of useful work in the Peter's Hall Medical District where he has been stationed for several years and he has the honour of being the first winner of the medal.

There was a large and representative gathering at the lecture and before Dr. Beebe commenced his discourse His Excellency said that the first thing they were going to do was to present to Dr. Ferguson the medal which he had won, but before doing so he would call on Dr. Conyers to say a few words about the circumstances and conditions under which the medal was given.

In response to the call Dr. Conyers said :

1. The old established firm of Messrs. Davson & Co., desiring to mark the centenary of the firm's existence in the colony, by the establishment of a prize fund, indicated their willingness to hand over to the Government a sum of £500, to be known as The Davson Centenary Fund, to be administered by a Committee appointed by the Governor, in the following manner :

(a) That a sufficient sum be set aside from the interest accruing to pay for a gold medal, to be awarded every 3 years, to the Medical Officer who has done most for the colony by medical research into the health and hygiene of its inhabitants.

(b) That the balance of interest be allocated as a donation, to whatever organisation or fund for the improvement of health or amelioration of disease in the colony, the Committee may decide on, as being most in need of and deserving of support (e.g. organisations such as the Tuberculosis Dispensary or the Baby Saving League). In this connection Messrs. Davson suggest that the winner of the gold medal be invited to express his views, as to the allocation of the donation for the year in which he has won the medal.

2. This most generous offer was accepted by the Government and a Committee consisting of the Hon. Dr. Wise, Surgeon General, Professor

Harrison, C.M.G., Director of Science and Agriculture, and Mr. W. M. B. Shields, attorney of Messrs. Davson, drew up regulations, which were approved by the Governor and published on the 5th May, 1917.

3. From these it will be seen (1) that the medal will be awarded every three years; (2) the first award will be made in September, 1917, and thereafter in September, 1920, and successive triennial periods; (3) the first award will be adjudged on work presented or published during the previous five years, whereas the subsequent awards will be adjudged on work presented or published during the previous triennial periods; (4) the award is limited to Government Medical Officers or those acting wholly or in part in the Government Service; (5) the award will be adjudged on papers presented to the British Guiana Branch of the British Medical Association, or on contributions to the British Guiana Medical Annual or other medical journals, or on reports to the Surgeon General or on a special thesis written for the purpose of the award; (6) the award is vested in a committee of three appointed by the Governor-in-Council, one of whom must be the Surgeon General or acting Surgeon General.

4. In accordance with these regulations, the above-mentioned Committee have had a considerable amount of very valuable work presented to them in the way of medical essays and reports, and after careful consideration have unanimously decided that Dr. J. E. A. Ferguson's work on anchylostomiasis and malaria on the sugar estates in the Peter's Hall Medical District entitle him to be the first recipient of the medal, as the one who had done most for the colony by medical research into the health and hygiene of its inhabitants. (Applause).

5. Taking charge of the Peter's Hall district in 1904 Dr. Ferguson found that the great majority of the coolies harboured the dread hook-worm. The resulting anæmia greatly impaired their efficiency as labourers and reduced their resistance to other diseases. In women its effects were manifested by sterility, premature birth and often by the death of mother and child. Thus not only was the mortality of the estates increased but the birth-rate was diminished.

6. By years of persistent effort, by the use of large doses of thymol and other anthelminthics which necessitated treatment in hospital, Dr. Ferguson was able to deal with the more severe cases of the disease. At the same time by improved sanitary measures and more particularly the provision of sufficient latrine accommodation, re-infection through a sewage contaminated soil, especially in the neighbourhood of the ranges, was to a large extent prevented.

7. Gradually by these methods a noticeable improvement in the estate's population became apparent and the labour supply correspondingly improved.

8. But although many of the severe cases were thus cured, the majority of the coolies continued to harbour the parasites in a minor degree not interfering to any great extent with their efficiency as

labourers, but ready under suitable conditions to produce the disease in its more severe type, and at all times able to communicate the disease to others.

9. How to deal with these minor infections, potentially dangerous to their hosts and to others, was indeed a difficult problem, if the whole work of the estates were not to be disorganised by treating large numbers in hospital.

10. Beginning experimentally with a few volunteers in November, 1908, Dr. Ferguson found that by a nightly dose of 10 grains of thymol he was able to rid them of their parasites in a few months, without interfering with their daily tasks. This was a great advance and gradually he extended the method to the other estates of the Diamond group.

11. In 1914 he was able to announce that he had dealt with a population of 5,781, that 3,369 had been found to harbour the hookworm out of 5,446 examined, and of these 2,292 or 68 per cent. had been cured—a notable achievement.

12. Turning his attention to malaria in 1910 Dr. Ferguson began his attack by the systematic administration of quinine, first of all to all children under 12 and later to the adult population of the estates. Gradually a marked improvement in the malarial rate was soon apparent, convulsions in children ceased to be common, and enlarged spleens diminished from a percentage of 34·7 in January, 1911, to 9·1 in January, 1914.

13. In the mean-time the death-rate on these estates had gradually fallen from 24·7, the average for the 3 years preceding 1911-12, to 16·5 in 1913-1914, and the birth-rate had gradually risen in the same period from 29·7 to 43·3 (Hear, hear.)

14. This great improvement in the vital statistics of these estates Dr. Ferguson admits also coincides with improved climatic conditions, which were reflected in improved statistics throughout the colony. But he invites comparison with the statistics of the villages, in the same area during the same periods where no such sanitary and therapeutic measures had been adopted and conclusively shows that no such marked changes in the birth and death-rates had occurred in the villages and therefore claims that the measures he had instituted had been largely responsible for the improved health conditions on the estates.

15. This valuable work has been presented to the Combined Court at its Annual Session in 1914 and was the incentive to the Rockefeller Commission to start work in the villages in the area, in which Dr. Ferguson had done so much for the estates. Its success has also led other Medical Officers to do work on the same lines on other estates, and the sugar planters, with a keen eye to the commercial aspects of the question have not been slow in aiding them in prosecuting the good work of hookworm extermination, malarial prevention, and improved sanitation. The results of such work have already been great and are destined in the future to be still greater. Dr. Ferguson as the instigator must feel that

he has done much for the health and hygiene of the colony and Messrs. Davson & Co. must feel proud that the first Centenary Medal should be bestowed on so worthy a recipient. (Applause).

In making the presentation His Excellency said that he had heard of Dr. Ferguson before he came to the colony and he remembered having had to refer to him in a despatch from British Honduras asking whether he thought it would be safe to give his (Dr. Ferguson's) treatment to people who were so fond of rum as many of the labourers in British Honduras were at the time. From that it would be seen that the work of Dr. Ferguson was not unknown to him, and everything being taken into consideration, he had much pleasure in presenting the doctor with the medal.

His Excellency then handed the medal to Dr. Ferguson who, in reply, thanked His Excellency for presenting him with the medal which he valued very much. He thanked Dr. Conyers for the kind things he had said about him and in an especial manner he thanked the Committee who had made the award.

IN A GUIANA JUNGLE.

The lecture, which was illustrated with a number of beautiful lantern slides, was a most instructive one, dealing more or less with the scientific side of nature, and it was highly appreciated by the audience.

The chair was taken by His Excellency who, without making an introductory speech, called upon the lecturer to deliver his address.

In the course of his lecture which was delivered in a very racy style, Dr. Beebe said that there were several reasons which made him hesitate in presenting this subject to them, the first being that the results of his work stood in startling contrast to that of Dr. Ferguson and his associates. The next thing he thought was whether the time was opportune for the giving of such a lecture, a time like this when he felt that all man's best efforts should be given to benefiting mankind in general. His work was of such that persons often asked what it was worth, and of what use it was, and he had found it very difficult to answer those two questions. At present the work he was doing here was that of pure science, a single search for truth among the creatures of the tropical world. He would show them pictures of creatures in their own country and attempt to tell them facts about the fauna of the country in which they lived. After travelling in many parts of the world he made up his mind to settle somewhere and attempt to go into the secrets of the evolution of insects and other branches of scientific study connected therewith and so he chose British Guiana.

Proceeding, Professor Beebe said that the slides which he had brought with him were the result of his activities in the interior and of his assistants and they would publish a book of about five hundred pages; the productions were taken from the back of Kalacoon at which place, a corner of the laboratory was seen. The Professor then took his audience to a jungle, which he said was unapproached by man since the time of the

Dutch. Leaving there, he showed a number of various Indian tribes, including the Ackawois who, as he pointed out on the screen, were remarkably well developed. Then they passed over Kalacoon to where the gold miners were, on to the diamond fields. They encountered a little Ackawoi hunter who shot a lot of game for them for the greater part of the time. Passing on, the waters of the Mazaruni river were brought to view and here the lecturer explained that those waters contained a kind of fish known as "pirai" which were very dangerous and were greatly feared by all who travelled in the river. It was very difficult, he said, to catch these fish on account of their voraciousness. With their formidable teeth, which were shown, they would almost bite through any wire.

Mr. Howes, their entomologist, took many handsome photographs, and it was only by those photographs that they hoped to gather anything. Referring to the seasons in that part of the interior, the lecturer said they were very remarkable and they corresponded to those in the north. As a matter of fact they were intensely interesting.

They also took some photographs of living creatures which they never had before. From the specimens they had in their northern museum, continued the lecturer, they would never have known anything about what they had seen. The giant marine toad, a photograph of which was shown, was also very interesting. A picture of the Virginia opossum, known as the yawarrie, was described by the Professor. He showed how the mother with her young would go out in the evening time, looking for food for them and how they clung to her tenaciously. The jungle scenes were also very interesting and edifying to him, said the Professor, and he said at this stage that he would invite the American Botanical Gardens to send down some of their men in these parts to make a study of these interesting things and above all the headquarters, he would suggest should be in British Guiana. (Applause.) It was so much better, he continued, to obtain real live photographs than to have the dry skeletons which gave them no information whatever.

Professor Beebe then gave an exhibition of the maam which he said was similar to the partridge, the only difference between them being the leg. One had a smooth pair of legs whilst the other's legs were rough. There was something very strange about the maam and that was that the male bird did all the incubating whilst the lady maam went to—"the Lor' knows where." (Laughter). The lecturer also dealt with what is known as "warracabras" or trumpeters. Various other species of the beasts and birds of our interior were dealt with, including the sloth, the Canje pheasants, and the "curious judicial-looking monkey,"—to use the lecturer's own phrase. In this colony, concluded Professor Beebe, more things could be seen and better too, than in any other place. And better ideas could be got here in a short time, than in a museum for a lifetime.

The lecture concluded, His Excellency said that he had listened to something very interesting in Professor Beebe's lecture. Professor Beebe would be surprised that he (the speaker) did not take the interest as he

(the lecturer) did, and the reason why was because he lives here (laughter) and those of us who lived here had so much to do (renewed laughter) that we would never do it as long as Professor Beebe could do it for us. Continuing, His Excellency paid a high tribute to Dr. Beebe's work of research, after which a hearty vote of thanks was accorded the lecturer on the suggestion of the Hon. Dr. Nunan.

OCCASIONAL NOTES.

A TRIBUTE TO THIS JOURNAL.

THE WORLD'S COLUMBIAN COMMISSION, 1893.

The Finding of a Board of International Judges.

DIPLOMA AND MEDAL AWARDED.

Exhibit: "Timehri," the Scientific Journal of Guiana, several Volumes.

Award.

The "Timehri" a semi-yearly journal published by the Royal Agricultural and Commercial Society of British Guiana, took its name from the natives' appellation of the pictured rocks on the large rivers, the work of some ancient and forgotten tribe. The volumes exhibited contain many papers based upon original researches in geology and the fauna, flora and native races of British Guiana. This able journal also records much of the history of the Colony and the enterprise of its citizens and displays the intelligent zeal and public spirit manifested by the Royal Agricultural and Commercial Society in the establishment and maintenance of its museum, library, reading room and scientific course of lectures. This institution, therefore, not only is to be commended for this exhibit of its work, but commands the sympathy and support of all persons interested in the development of the Sciences in South America.

ALICE M. FLETCHER, Individual Judge.

JOHN BOYD THACHER, Chairman, Executive

Committee of Awards.

(Copied from a Diploma in our Museum.)

Nelson's Conduct in Barbados, 1786.—The Records of Barbados are full of interest although (unfortunately enough) they are consulted by but few Barbadians. Nor is this interest merely parochial; sometimes one touches a figure of world fame. Here is an extract from the minutes of a meeting of Council held under the presidency of Governor D. Parry on July 4, 1786:—

"The Governor said he wished to make mention of a remarkable matter which had lately happened. That what he alluded to was the conduct of Captain Nelson, the Commander of His Majesty's Ship of War, Boreas, who had undertaken without authority, and in an arbitrary manner, to take away with him from Carlisle Bay two vessels which were depending as seizures before the Court of Vice-Admiralty in this Island; a conduct which demanded Reprehension, and could not be submitted to without opposition in a Civil Government. His Excellency added that in turning over some old minutes of this Board he had found that during the administration of Governor Byng something had happened which required an inves-

tigation of the Powers of Commanders of Vessels of War within the Ports of these Islands, and that a letter stood on record from the Right Honourable The Lords Commissioners for Trade and Plantations to Mr. Byng dated Whitehall, August 8th, 1740, inclosing the opinion of Mr. Fane, their Council-at-Law, 'That no ships or vessels offending against the several Acts of Trade can be seized by His Majesty's ships of War within the limits of any Port within the territories of the respective Governors of His Majesty's Plantations.' The present affair (His Excellency said) was of such notoriety that he could not but suppose the gentlemen now sitting with him were all possessed therewith and knew as well of the seizures which the said Captain Nelson had made while lying at anchor in Carlisle Bay as of the subsequent Flagrant impropriety above mentioned; but that he thought it right to introduce it now before this Board, to anticipate what might ensue from the steps he had taken to counteract proceedings against the vessels in the other Islands, and to acquaint the Board that he intended at a future season to bring the matter more fully on for their advice and opinion, whenever His Excellency shall arrive at the knowledge of the full extent of Captain Nelson's Deportment."

At a meeting on August 29 :—

"His Excellency adverted to what stood in the minutes of last meeting relative to Captain Nelson of His Majesty's Ship *Boreas*, and informed the Board that he had since received the proceedings of the Court of Admiralty of Nevis against the Vessels seized here by Captain Nelson, which, as before related, he had taken from hence without authority. That the Judge at Nevis had thought himself competent to try the Vessels in his Court and that His Excellency's claim to a share of them, upon condemnation, had therefore by his direction been put in in due time; but the said Judge had also thought proper to disallow and dismiss such claim of the Governor of Barbados. His Excellency declared that from the motive of supporting and defending the Rights of a Governor, and being tenacious of his own privileges for the sake of his successors, he had appealed from the sentence given in the Admiralty Court of Nevis and had got the Appeal Papers which he took this opportunity of showing to this Board previous to his sending them to England. These papers being voluminous their Honours referred to some of the most particular parts only as pointed out by His Excellency the most remarkable in Captain Nelson's Conduct; but recommended it to him by all means to prosecute such Appeal, thanking His Excellency for the communication."

In the duplicate volume of the Council Minutes, copied with his own hand by Mr. Nathan Lucas—Judge Lucas of Farley Hill,—the Antiquary of Old Barbados adds the following interesting foot-note :—

"When Captain Nelson seized these vessels in Carlisle Bay, he desired the proper Officers to libel them directly as trading

against the Navigation Laws. They, not thinking themselves bound by his order, demurred as to the legal mode, etc., etc. Mr. Charles Brandford, the Attorney General of that day and also Advocate General (as was customary at that period), a great humourist and of a very impatient and impracticable temper, was very restive with Captain Nelson and said he would take his own time and proceed as he thought best and proper in the case. Nelson could not brook the indecision and delay and the nice distinction of Seizures in Port by the Navy or Custom House. They were trading contrary to the Navigation Laws, and were enemies to England, of course; and he set off with the vessels for Nevis, where they were instantly libelled and condemned. Governor Parry sent the late Alexander Malet, Esq., of the Custom House, and a man of address and business, after him. He put in the Governor's Claim for his part of the seizure, etc., etc., but it was not substantiated and Governor Parry appealed but I believe never got anything, at least to my knowledge. I very well remember the whole transaction and my connection with Mr. Malet afforded me good opportunity of knowing the whole. It is rather surprising this affair has never been noticed in the Life of Nelson, for surely his decision of character, manly spirit, and hatred of Old England's Enemies are as strongly marked in this instance as in any other brought forward at Nevis against the Americans for breach of the Navigation Laws."—J.G.C.

The First Local Exhibition.—It may be interesting to note that this was held at the Queen's College Grammar School, January 2nd, 1855. It appears that para grass, now so common everywhere, was then rare. The "Royal Gazette" said a specimen was shown and it was anticipated that its cultivation would be very important. There was also a sewing machine, probably the first seen in the colony. The paper said: "Mr. Davis was there with his machine for ruining the trade of journeyman tailors; surrounded by a crowd of ladies, who looked with wonder on a single little instrument, which can sew canvas as well as stitch muslin handkerchiefs in a period of time scarcely to allow a needle to be threaded." The writer did not anticipate that the machine would become the salvation instead of ruin of tailors and dressmakers. The "Gazette" said: "As a first attempt it was most perfectly successful." The exhibits were mostly sent to Paris for the French Exhibition of the same year; like all the early shows it was the work of our Society.

In view of the fact that the Queen's College building has lately been vacated, it may be as well to mention that it was built in 1853. The school was, however, started in 1844 and was carried on in the Old Colony House at first and then in a house in Main Street. The school building cost £5,000 which was raised by donations, a Government grant of unclaimed slave compensation money and grants from English societies.

J R.

Origin of the Use of Tobacco.—From much evidence I have tentatively come to the conclusion that Tobacco was originally adopted to

stave off hunger. I have lately been informed that Macushis carry a few leaves in their wallets when on journeys or when out hunting, chewing a piece when hungry if a meal is not forthcoming. Every smoker knows that a pipe or a cigarette will have the same effect without the possible nausea of chewing the leaves. The line of development of the use of tobacco was probably through chewing green leaves, then using tobacco water as at puberty, and Peaiman ordeals, to the final stages of smoking as cigars, or in pipes. We may safely state that all habits and instincts that have lasted a long time were once useful, but at the same time such habits may become effete under changed conditions. Other intoxicants probably rose to allay hunger or the consequent faintness.—J.R.

No Inferior Animals or Men—No Real Pests.—A great deal has been said of man as a *superior* animal and of some men as inferior to others, but it seems plain that everyone succeeds because it excels in some way. It may be out of place and therefore fail, but under natural conditions it could not succeed unless it possessed some quality necessary to success. It is obvious that no real failure could exist for any length of time; it follows therefore that every living thing survives because it is fitted to do so. A species is made up of individuals, some of which are more advanced than others—the whole is a success when part may fail, but the failures drop out. It follows therefore that nothing is an unmitigated pest in its right place, but may become so under other circumstances. A race of mankind may appear lower than another from a few standpoints, but we can always find something in which it excels. Every species and even every individual that exists to-day remains because of its excellence—it is the head of a line and must be better in some way than its ancestors. Nothing is stagnant, for antecedents and consequents (really one) accumulate to produce a progressive continuity of every line. By careful study we can find where a species or individual excels and plainly see that nothing is really evil or bad. In studying pests we should try to get right views. Possibly one of the best examples is the wood-ant or termite, a most valuable economic agent in the forests to prepare the dead trees into suitable food for the living. Its work is admirable and yet most people look upon it as an unmitigated pest. It is simply out of place in our houses and like dirt, which has been defined as matter in the wrong place, it has to be excluded. To balance the good against supposed evil is the ideal, but we must always keep in view the fact that nothing really bad ever could be retained because of the natural checks. Man has already made several unfortunate attempts to bring animals and plants out from their natural conditions until they become pests, and some of our sanitary officers advocate measures, not always best, which remove nature's agents before something better has been obtained. Suppose we have rotting organic matter and carrion about our houses some of the so-called pests will remove it. Some time ago a careful investigation of the means of destroying rats and mice was made and the conclusion was that so long as food was provided for them in the rubbish bins, so long we shall have them. The

same applies to vultures which pollute our gutters, they will come so long as carrion can be found. Dirt, carrion and damaged food bring most of our pests.—J.R.

Guiana Furs.—It has been suggested that some of the wild animals of this colony such as opossums have furs suitable for muffs, etc. It would be well to protest at every stage against wanton destruction of wild animals where they are harmless, and it may be suggested that rabbits can supply all the furs really necessary without going into the tropics and disturbing the balance of life. What we want is a rational public opinion that will be against destroying rare beasts and birds when there are skins and feathers procurable from food animals everywhere. Personally, and as a naturalist, I should not however be favourable to legal prohibitions for we have too much law already for an *undeveloped* country.—J.R.

The Balance of Life.—This is so beautifully kept here under natural conditions that it would be a pity to spoil it. We hear of such an animal being a pest yet when we look carefully into the matter we find it to be really essential to the welfare of the whole. Everybody has a horror of snakes, especially in the cane-fields, yet they keep down real pests such as rats and mice as well as acouris, labbas and other rodents which might some day be real dangers. Bats again are shunned and often killed when many of them are insect eaters as are also frogs and toads. Even scorpions and centipedes feed on cockroaches which our housewives dislike and ants in our beds destroy bugs.—J.R.

Old Glen, the Hermit of Mibirri Creek.—As this eccentric character was closely connected with Waterton and his friend Edmonstone, it is desirable to note that he was very prominent in connection with the founding of the New Jerusalem Church in America. A Convention was held in Philadelphia in June, 1917, in connection with which a bronze memorial tablet, with the following inscription was unveiled :—

BELL'S BOOK STORE.
HERE IN
1784
WAS DELIVERED BY
JAMES GLEN
OF DEMERARA, B.G.,
THE FIRST PUBLIC LECTURE
EVER GIVEN ON THE
CHRISTIAN DOCTRINES
SET FORTH BY
SWEDENBORG.

At the Convention Mr. Hay gave an account of the early workers including Glen ; it is reported in the New-Church Messenger, June 20th as follows :—

After speaking of an advertisement inviting Swedenborg readers to unite, he said—

"This brought James Glen, a Scotchman, who was on his way to settle at Demerara, South America. He related how the Captain of a ship in which he had sailed back from a previous voyage to South America, had presented a copy of 'Heaven and Hell' to him, which had filled him with astonishment first at the nature of the information given, and second at the goodness of the Divine Providence in opening his mind to such a flood of spiritual truth.

"So Mr. Glen sailed for America, full of gratitude and happiness, to become the pioneer missionary of the Lord in His Second Coming to the new world of freedom—of democracy—and in this peculiar sense perhaps the new earth prepared to receive the New Jerusalem now descending from God out of heaven. On June 5, 1784 at Bell's auction room and book store he gave the first public proclamation of the New Church in America, if not in the world, and succeeded in so interesting Francis Bailey, a printer . . . and one or two others, that they soon became the nucleus of the New Church in Pennsylvania. He delivered two more lectures in the same place, and then went to Boston and lectured with similar results. Discouraged that so few sympathized with him in this great gift of heavenly light, he sailed for his new home in Demerara, where he established the first society of the New Jerusalem in the western hemisphere. After his departure a box of books from Mr. Hindmarsh arrived for him at Philadelphia, which being unclaimed were sold at public auction. They fell into the hands of Hetty Barclay and others, and directly and indirectly made many more converts than had the voice of the missionary himself.—J.R."

Tercentenary of Raleigh's Execution.—The year 1618 saw the end of Sir Walter Raleigh's career and we need no excuse for mentioning it even though we are not likely to have any commemoration. The Stuart Kings made many mistakes, but probably none so disgraceful as the execution of one of the greatest men of the Elizabethan period. Our debt to him as the revealer of Guiana to the world is very great for even the Dutch used the results of his own explorations and those of his captains in their early voyages. The story of his failure to get gold from Guiana, which appears to have been the real cause of his execution, is painful even now, and is so well known that it needs no repetition. Raleigh had grand ideas, and might have developed Guiana as a British province had he been supported by the Government of his time. Queen Elizabeth favoured his ideas but James I. spoiled much and damped the ardour of British pioneers in Guiana as well as in Virginia. Our part of the continent was neglected but what is now the United States is largely due to the initiative of Raleigh. Commemorations have become almost too common of late years, but there is still room here for a river or street name to keep us in mind of the greatest pioneer of our country. It may be noted that the Orinoco was renamed Raleana and the Essequibo Devoritia (after the Earl of Essex, Devereaux) by some of the followers of the grand Knight, but these names are not retained.—J.R.

Colonial Development.—This has been urged over and over again for the last century, with little result. We must not however forget that slow progress has been made, for even during the last fifty years steamers have been run on the rivers and the exploitation of balata, gold and diamonds carried on. Much more might have been done, but we have not been quite at a stand-still. Last time I went up the Demerara River I noticed much improvement along the banks; framed houses had largely taken the place of troolie huts and there were many indications that the jungle was being cleared and cultivated. When I first visited the same district the conditions under which the bovianders lived were sordid in the extreme and yet they seemed happy. Their lives were free from real care, for so little was required to keep them going from day to day. At that time I found primitive Indian settlements up the creeks where now a different type is to be seen. There is no doubt that a slow transition is now going on and the process is not perhaps very conspicuous or interesting. But something may result in time that will be beneficial to the whole colony.—J.R.

Mr. Beebe's New Book.—"Tropical Wild Life" is a grand step in the right direction. Never before have we had an ornithological book so generally readable and yet so scientific. Even what the average reader will call the dry parts are enlivened by tit-bits of information about the manners and customs of birds that make them interesting to anyone. Mr. Beebe will no doubt deplore those necessary duties which prevent for the present his continuing the work at Kalacoon. Everything now is left over till after the war, when possibly Mr. Beebe, who is or was in a Flying Corps, may perhaps find some way of hovering above the forest canopy to study the wild life which is now so imperfectly known. The Research Station has been a success as far as it went, and we may hope for greater knowledge when it is continued. It would indeed be a disaster were anything to happen that might prevent further investigation on the lines laid down. More and more every year is it found necessary to study nature in the wilds instead of the museum or office. Natural history can hardly be learnt without real study of living animals; the nature of the organism is learnt from seeing what it does. It is of course necessary to know what it is but even this can hardly be gathered by dissecting or studying outside characters.

The book is full of illustrations some of which are excellent and all good. Messrs. Hartley and Howes collaborate and there are two appendices by Rev. Walter White and another.—J.R.

Surinam Folk Tales.—There is an interesting paper in the Journal of American Folk-lore by A. P. and T. E. Penard, giving a short account of the Anansi stories of Surinam, with four examples. The following from the foot notes are worth reprinting :—

"The *bakroe* is commonly conceived as a dwarf, one side of whose body is wood and the other flesh. When anyone approaches him the *bakroe* presents his side of wood to receive the blows which he expects ;

but he may also take the form of an old woman, an animal, a headless cock, or an inanimate object. He haunts bridges, ditches and wells. *Bakroes* are not very malicious unless molested, but they allow themselves to be used by the *obiaman* in his evil practices."

"The *Leba* is the spirit of Misery. She is described as having the appearance of an old woman whose body is completely covered with rags. She is bowed down with a heavy burden of debts and sins, a portion of which she is constantly attempting to pass to the unwary wanderer who approaches her. Especially children fall an easy prey to her cunning. The presence of *leba* in a person manifests itself by loss of appetite, listlessness—a feeling as if the body were carrying an unnatural weight. At first, amulets are applied and all kinds of light objects such as dry leaves or pieces of cork are worn by the sufferer with the idea of *reducing* the heavy weight. But if these means fail the patient might submit to the *wiweri-watra* (herb-water) treatment, which is administered by the *obiaman*."

Thunderbolts.—In the same Journal Messrs. A. P. and T. E. Penard give an interesting account of the notions of the Surinam negroes in regard to stone artifacts. The idea that they come down with heavy rains is common in Europe and possibly it has not originated here. I have known people in Demerara to hold them in veneration but in Surinam they are used as charms and medicines.

"A woman told us that she had completely cured herself of rheumatism by bathing every morning at five o'clock in a tub of thunder-stone water. Another woman said that she had cured three of her children of convulsions by means of powder made from a thunder-stone. A man said that he had cured himself of a severe lameness in the back and congestion of the lungs, by the use of thunder-stone water mixed with some water in which an ass had snorted, and a little sand taken from the spot on which an ass had rolled, and that his back had not only gained its original strength, but had become as strong as that of the ass."

"They are potent factors in driving away evil spirits."

"Not only do thunder-stones drive away the bad things, but they attract the good. An acquaintance once saw a man fishing, who used instead of the usual lead weight or common stone, a thunder-stone, which he believed attracted the fish to his line. He would not sell the stone although he was offered a good price for it."

Even the Indians have generally forgotten that they once used them as tools and weapons, but the *Piainen* have esoteric knowledge of many things not known outside. The Messrs. Penard have got some peeps into this arcana and promise to publish the results, which we hope they may do within a year or two. As a specimen they give the *Aula* or word of the Thunder with the following translation:—

"I am the Thunder; the terror of the earth reflects my one-ness,

The earth I do vibrate, I the Thunder.
 All flesh fears that reflects the one-ness of the Thunder.
 I pass along my field ;
 With swiftness all must move out of the way.
 The lightning precedes me.
 The thunder-axe I have made, I the Thunder."

From another *Aula* they give the following—

"I am the force of the spirit of the *Pulake*, (electric eel), the
 thunder-axe, the stone
 I am the force of the firefly,
 thunder and lightning I have created."

In a legend of the Thunder the rain-spirit is full of wrath at the would-be ravisher of his daughters, the Rain-maidens, and shouts to lightning to hurl the axe. The fugitive Indian shelters himself against the storm under a big tree but the lightning splits the tree and drives him out to be pelted by the Rain-maidens. He runs but is followed everywhere until his friends hide him under a pot.—J.R.

Macaulay's New Zealander.—The following from Notes and Queries, Dec. 6th, 1902, suggests that the "New Zealander" may be a British South American.

Older writers may have suggested to Macaulay his New Zealander. Perhaps the following passage, parallel to it, has not been noticed. It is from Sismondi's 'Literature of the South of Europe,' published originally in 1813, Roscoe's translation, chap. ii. :—

"Who may say that Europe itself, whither the empire of letters and of science has been transported, which sheds so brilliant a light, which forms so correct a judgment of the past, and which compares so well the successive reigns of the literature and manners of antiquity, shall not in a few ages become as wild and deserted as the hills of Mauritania, the sands of Egypt, and the valleys of Anatolia? Who may say that in some new land, perhaps in those lofty regions, whence the Oronoco and the river of the Amazons have their source, or perhaps in the impregnable mountain-fastnesses of New Holland, nations with other manners, other languages, other thoughts, and other religions, shall not arise once more to renew the human race, and to study the past as we have studied it; nations who, hearing with astonishment of our existence that our knowledge was as extensive as their own, and, that we, like themselves, placed our trust in the stability of fame, shall pity our impotent efforts?"—J.R.

Losses of prominent Members.—We have to deplore the loss by death of several prominent members of the Society during the last year. Mr. Godfrey F. Franks was an exceedingly valuable member who had been President, Chairman of several Committees and a Director. He was peculiarly valuable to the Museum and helped much in arranging the

Geological section. He was Literary editor of this Journal for some time, and though not a writer was very helpful in many ways. Mr. Frank Fowler was a useful member for many years and served on Committees. Mr. C. W. Anderson was one who could not be well spared, because he was working to identify the botanical sources of our timber trees. Mr. John Williams will be much missed at our Lantern Lectures for he was always ready to oblige the Society. We have had to thank him on many occasions for his good photographic work some of which has been used in this journal. Mr. R. G. Duncan retired from the colony and died in England; he had been very prominent as a sugar planter and was President of the Society as well as a member of Committees. While President he read a paper on the "Cost of Sugar Production" (Timehri, 1894 p. 114) which was considered of much value.

An addition to our Bird Fauna—Through the kindness of Mr. W. Mearns of "Hope" the museum has received a head of a male *Sarcidiornis carunculata*, a rather curious duck, which seems to be somewhat rare though it has been recorded from the mouths of the Amazon down to the Argentine. The male has a wattle or comb on its bill, which is most conspicuous at the breeding season; this character is peculiar to the genus, but is absent from the female, which is smaller. As far as I can find it has not been recorded from Surinam or British Guiana but there is mention of it in Cayenne.

EMPIRE DAY.

MEETING OF THE ROYAL COLONIAL INSTITUTE AND THE R. A. & C. SOCIETY,

MAY 24TH, 1918.

Empire Day, the anniversary of the birth of our late Queen Victoria, of happy memory, was celebrated in a very fitting manner by the B.G. Branch of the Royal Colonial Institute and the Royal Agricultural and Commercial Society, when a joint meeting under the auspices of both organisations was held in the R. A. & C. Society's Rooms. Among those present were His Excellency the Governor, Sir Wilfred Collett, K.C.M.G., patron of the B.G. Branch of the Royal Colonial Institute, and also vice-patron of the R. A. and C. Society. In response to an invitation Capt. Dimitrijevič, of the Serbian Army, attended for the purpose of delivering a lecture on "Serbia and the War."

After being introduced by Dr. Nunan the lecturer opened with a description of the Bulgarians. These people who could better be described as "Bulgars" were not of the true Slavonic race as was generally thought. They originated from a barbarous race that invaded the Balkans in the olden days, and having captured land by force of arms, they settled and in order to pretend to civilization, they adopted the Slavonic language and some customs. They extended their rule by terror and murder. They were well known in the history of the Balkans for their barbarism, and even to-day they were no better than the Germans, and could well be described as the Huns of the Balkans. Their rulers were always famous for their savagery. One, in order to reign in peace killed his father, mother, brother and all his family.

Describing Bulgarian justice, he said in the case of a man accused of a crime if he did not confess to the judge, he was struck on the head with a club. Even if he was innocent he had to say he was guilty as the judge would continually club him until he owned up that he had committed the offence. The other punishments included cutting off of ears, noses, hands, toes, etc. The Serbian justice stood out in vivid contrast with this barbarism. In Serbia a man was tried by a jury both in civil and criminal proceedings and in the case of a foreigner half of the jury were not only composed of foreigners but members of the accused man's race. Thus Serbia's justice was on the principle of the English justice. Dealing with the liberation of Bulgaria from the Turkish yoke he said Serbia was the only nation in the Balkans that freed itself by its own arms from the tyranny of the Turk. Bulgaria was liberated by Russia, and this at the request of England. Thus it was said that Bulgaria had to thank Gladstone's pen as much as it had to thank Russia for her liberation. The perfidy of the Bulgars was demonstrated by their assistance to the enemy against their former liberators and against Serbia who had also assisted in some measure in her liberation.

The lecturer then said that to amuse them he would tell them something about the social life of the Bulgarians. They married only for interest and on many occasions the man did not see his future wife until after he was married to her. These marriages were arranged not that the women should give the men anything but that the parents of the girls should be paid by the parents of the boy before they were given over. He compared that with the selling of a cow, because in nearly every instance the price paid, which was about \$20, was not more than could buy a cow. The men were married very young, but the women very old and sometimes a boy of thirteen or fourteen married a woman of forty. Sometimes persons on visiting their houses who were not well-acquainted with them would ask the boy, is that your mother? only to get the answer that she was his wife. He would not lose the opportunity of saying how the war came about and when he began his lecture he did not intend to speak of the barbarities of the Germans, but he felt that if he did not do so he could not sleep well, so he spoke not only to give satisfaction to them but to himself.

He then spoke of the murder on the 5th February, 1911, of the servant of the German Legation at Chili by the Secretary of the Legation which he said was done in order to bring about war to seize a Chilian island and referred to it as the ingenuity of the Germans to make crime for grasping territory.

Concluding he said that he felt it a great honour to be invited to lecture to them that evening and thanked His Excellency who was so noble as to give his patronage at his first lecture and to be again present that evening. When he went back to his native land and met his brothers he would tell them of the honour he had met with around the world and in British Guiana. He would advise the men of his race to fight until the last of them was left, because their fight gave them reputation among all civilised nations and if they did their part their reputation would remain. He further thanked the audience for their kind attention.

In moving a vote of thanks to the lecturer, His Grace the Archbishop said that for once in their lives they had seen a representative of that small but gallant nation which had stood out prominently and had been making history in their own times and for that they were exceedingly grateful. He proposed to convey the thanks of the audience to Capt. Dimitrijevic for the lecture and to say that they were exceedingly glad that they had had the pleasure to listen to him. (Cheers).

The vote was seconded by Sir Charles Cox.

His Excellency said that it seemed almost superfluous to put the motion to the vote because they had voted twice already. Although he had been in the Near East he had never met any Serbian before, neither had he seen any Bulgarians. Serbia had always had the reputation of being a brave fighting nation. That nation had not always fought against

the Turks ; it had sometimes fought with them but whichever side it fought it had always had a good cause and it had fought well. It was perfectly true that Bulgaria did not fight for her liberation from the Turks, but during the war the Serbians came in and they did a good deal in obtaining that liberty for Serbians, the return for which they all knew. He was very sorry that the Bulgarians were of the same origin as his friends the Turks but, of course, the Serbians were of a very different stock. It was a very good thing for them to see something of the mind of an inhabitant of the Balkans and to understand how the people of one race there differed from the people of another. As a matter of form he now asked them to signify their thanks to the lecturer.

The audience applauded loudly, Captain Dimitrijevič responding with a bow.

The following resolutions were then moved by Professor Harrison :—

Resolved—That this meeting of the Royal Agricultural & Commercial Society of British Guiana and of the Royal Colonial Institute (British Guiana branch) regards with pride the victorious strategic defensive of Sir Douglas Haig's and the other Allied Armies in Belgium, France and Italy since March 21st and looks with confidence (when the hour for the strategic offensive arrives at its appointed time) for final victory under the supreme command of General Foch, the hero of Nancy, of the Marne, of Ypres and of Champagne.

2. That inasmuch as any peace without the destruction of the military power and ambitions of Prussia would be only a respite which would enable her despotic rulers and unbalanced people to prepare for a still more destructive and unscrupulous war in the hope of enslaving the world, we pledge ourselves to support any measures which the Imperial Government may decide to be necessary or advisable for the increase and consolidation of the military and economic resources of the British Empire with a view to the utmost prosecution of this righteous war, for human liberty and British honour.

3. That we adhere to our resolution of Empire Day 1917 as to the necessity of taking early and practical measures to prepare the Empire and its tropical colonies for the economic conditions which will inevitably arise at the close of the war, and we consider that any other policy may find us as unprepared for peace as we admittedly were for war.

4. That we regard the restitution of the liberty of Serbia and Montenegro as an essential part of the Allied aims and we have a profound sympathy with the desire of the Serbian race of all religions for reunion with their brothers of the Kingdom. We realise the debt of the Allies to the heroic nation which won the first victories of the war on the 18th August, 1914, at Shabats and on the Jadar and which is still fighting on its own soil against the common foe.

5. That copies of these resolutions be sent to the Secretary of State or the Colonies.

The above resolutions were prepared by the officers of the Royal Agricultural and Commercial Society and the Royal Colonial Institute (B.G. branch).

Sir Charles Cox, in seconding the resolution, said that if it was possible to increase their determination—that determination being now at its highest—to carry on the war to a just and glorious end he thought that the lecture they had heard might add warmth to that determination.

His Excellency : Of course, this is really non-contentious (laughter), but before putting it I would ask if anyone wishes to oppose it or propose any amendment or addition to it or to take it in section, or to take it in one lump as read by our president. (Laughter.) As nothing is said I must put it in the way moved and seconded, one vote for the whole of the motion. Is the motion agreed to ?

The motion was carried by a round of applause.

Professor Harrison having thanked His Excellency for attending, the proceedings terminated.

PROCEEDINGS OF THE SOCIETY.

Meeting, July 9th, 1917.—His Excellency the Governor took the chair and introduced Mr. J. Rodway who gave "A Chat about the Society's Past." (See page 26).

On the motion of Mr. W. S. Cameron, seconded by the Bishop of Guiana, a vote of thanks was accorded. (In connection with the "Chat" a number of exhibits bearing upon the subject were displayed. These included portraits, views, plans, diplomas, manuscripts and printed matter.)

Meeting, December 28th, 1917.—Notice of motion to amend two By-Laws was given.

The President (Hon. Dr. Nunan) spoke of the work of the Society during the year and gave an outline of its position.

The Office-Bearers for 1918 were then elected, the retiring President nominating his successor, Prof. J. B. Harrison, C.M.G., etc., and speaking of the desirability of full co-operation of the Society with the Department of Agriculture.

Meeting held Feb. 4th, 1918.—The following amendments of the By-Laws were passed :—

By-Law 1, Chap. III. after Treasurer, ten or *more* Ordinary Directors.

By-Law 5, Chap. IV. to be replaced by—

5. The Office-bearers shall be ex-officio members of all Committees

The financial statement for 1917 was laid on the table and a short review by the Treasurer of the position of the Society read. There was an adverse balance of \$631.90 and a further extra expense of \$120 incurred in the present year.

The President gave the first part of an Inaugural Address (see p. vii.) A cordial vote of thanks was unanimously voted. Several members spoke warmly in favour of the address and the President thanked them for their appreciation,

Meeting, April 17th, 1918.—The financial statement having been audited, was adopted.

Thanks were accorded for the following donations—From Dr. A. J. Craigen, 35 New Guinea Ethnological Curios; from Mr. C. K. Bancroft, a block of inferior Venezuelan Balata.

A letter from the Government in reference to the proposed Agricultural Conference was read. The Hon. Dr. Nunan proposed in connection therewith the following resolution which was unanimously carried :—

"The Society regrets that it has been found that arrangements cannot be conveniently made for the holding of a West Indian Agricultural

Conference until the conclusion of the war, and is of opinion that the preparation of British Guiana and the West Indies by inter-colonial discussion to meet the agricultural conditions which will inevitably or probably follow the war, should not be postponed until after the war.

“The Society is of opinion that the discussion of the programme of a West Indian Agricultural Conference with the West Indian Governments to be held immediately after the war, unless altered circumstances shall allow it to be held earlier, should be at once instituted by the Government of the Colony in accordance with the suggestion of the Secretary of State conveyed to the Society in His Excellency's letter of 12th, February, and that arrangements should be made for the holding of the said Conference in British Guiana as proposed but postponed in 1910 and that the Secretary of State be asked to communicate with the Imperial Commissioner of Agriculture to this effect.”

The President gave the continuation of his Inaugural Address, in the course of which he showed specimens of rocks, going to prove that some of the lands of the interior would be barren if cleared.

On the motion of Hon. R. E. Brassington, a hearty vote of thanks was accorded; Mr. N. Bascom seconding and speaking of the value of the address.

APPENDIX.

I.

THE GEORGETOWN—MANAOS RAILWAY.

SIR WALTER EGERTON'S VIEWS.

SOCIETY OF ARTS, LONDON, APRIL 30TH, 1918.

TAPPING THE AMAZON VALLEY.

The presence of arapaima in the Rupununi and of a very vicious little biting fly, one of the pests of the Amazon, are held to be proofs that once the waters of the Rupununi valley drained into that river. Even now the height of the divide between the sea and the Amazon valley is only some 250 ft., and in the wet season the waters of the two river systems approach within half a mile of each other, and Indians drag their canoes across the watershed. If ever the middle Amazon is to be given a route from Manaos, more than a thousand miles shorter than the river route to the United States and Canada, surely it will be over this low watershed to Georgetown. If the line is constructed to Manaos its extension to meet the southern railway systems of Brazil and the Argentine can only be a question of time. The Takutu, on the Brazilian boundary, runs into the Rio Branco, one of the chief tributaries of the Amazon, joining that river near Manaos.

THE PROJECTED FRONTIER RAILWAY.

The British Guiana section, if taken from Georgetown to the junction of the Ireng with the Takutu, to which point launches easily ascend, would be some 340 miles. Its construction presents no engineering difficulties, and the cost of a metre-gauge line was estimated by Mr. Bland at only £3,500 a mile. Mr. Buck, the Colonial Director of Public Works, has recently investigated the problem afresh, and recommends a slight variation of the route at Georgetown end, but confirms Mr. Bland's estimate of mileage cost.

I will not here discuss the relative advantages of the two routes beyond remarking that by Mr. Buck's route the distance to the Takutu is increased by twenty-six miles, a very serious consideration as traffic increases, and that Wismar, the probable headquarters of a great bauxite industry, would be left without any other communication with Georgetown than the lengthy river route.

Dr. Nunan, the present Attorney General of British Guiana, had done much to boom this attractive railway project before my arrival in the colony, and succeeded in raising great enthusiasm on the subject. Many of the leading men see in this line even without the Manaos extension, a solution of the problem of the colony's development. I agree with them, and I had hoped to return to England in August, 1914, to press

the subject on Mr. Harcourt's attention. I knew he realised its importance, and it would have been fitting that he, one of whose distant ancestors received a grant of the country from James I. and twice attempted to take possession of his property, should be the Minister to finally render the development of its rich interior possible.

THE FINANCIAL PROBLEMS.

The question of financing its construction, however, bristles with difficulties. In the colony there is much divergence of opinion. The planters of the coast fear the loss of their labour, and urge that the scheme must be accompanied by a costly supplementary one for the introduction of many thousands of settlers. Another section is against construction by Government, refusing to see that it is a project impossible for private enterprise as there is no prospect of paying even working expenses for at least ten years. These people are misled by concession hunters, inexperienced and over-sanguine, to take a charitable view of their promises, who offer to construct the line on easy terms without having the remotest chance of finding capitalists to finance their proposals. The line, if built, must be built with Government money. The colony can not afford to carry out the work.

Here seems to me a project eminently worthy of the attention of the Empire Resources Development Committee, not, however, with a view to further development at the expense and for the benefit of the Mother Country, except indirectly. Where would Britain be without her oversea possessions and, taking the tropical colonies alone, it would be instructive to calculate how many millions are annually poured into the Imperial Exchequer as income-tax, now swollen further by excess profits duty, on receipts by her citizens from their oversea properties, and, on their decease, by death duties thereon. Is it too much that in return the Mother Country should advance, as in the case of the Uganda railway, the means of giving the people, both of the colony and of the United Kingdom, a chance of proving their ability to take advantage of the opportunities so offered?

MR. CHAMBERLAIN'S WORK FOR WEST AFRICA.

Until Mr. Chamberlain ruled at the Colonial Office our West African colonies were in a much worse state of stagnation than British Guiana. Under his guiding hand, and with financial help from the Treasury, railways began to be pushed up from the coast in each of our West African possessions, with the result that nowhere is there more rapid progress to be seen than in those possessions. Without the progress so ensured we should now be without urgently needed vegetable fats, without our chief source of cocoa supply, and without the troops that have borne the brunt of the fighting in subduing Togoland, the Kameruns, and German East Africa.

CATTLE TRADE POSSIBILITIES.

Within ten years of the completion of a railway to the savannahs in the interior the cattle traffic should alone be sufficient to cover working

expenditure. But great development in mining, the timber trade, and in the exploitation of other forest products may be looked for, as well as the beginnings of agriculture, nor is it likely that with a railway on the Takutu the Brazilians could long resist extending it to Manaos, or at least to a point in the Rio Branco, and thus secure the immense advantage of a direct route to the North Atlantic at Georgetown. With such an extension there would be no further anxiety regarding the financial prospects of the line.

Note by Editor.—I can bear testimony to the fact that the present Viscount Harcourt, when Secretary of State for the Colonies, realized the importance of the proposed trunk railway. After the few ascertained facts had been placed before him by the Editor at an interview in February, 1912, four months before Sir Walter Egerton's arrival in the Colony, Mr. Harcourt sent for the Editor in November, 1912, and again in June, 1914, to enquire as to the progress of the movement. Mr. Harcourt had recommended the matter to His Excellency's special attention and had carefully annotated and studied the Report of the Railway Committee and the attached memorandum, which had reached him by extra-official channels. The arguments in favour of a combined colonization and railway development he considered sound. Sir Walter at the time was opposed to such a combination, but his lecture shows that he does not underrate the importance of colonization. The suggestion of a preliminary reconnaissance and economic survey of the route and of negotiations with Brazil for a local Zollverein or commercial treaty Mr. Harcourt seemed to accept as essential first steps. Further discussion and a final decision were to follow the arrival of the Governor in London from the Colony.

Dis aliter visum. The war broke out. Sir Walter was unable to leave the colony. Later developments include the inauguration of the cattle trail scheme by Mr. Melville and Mr. Buck's proposal to utilize the Demerara Railway as far as the Abary. The purely subjective view expressed from one quarter that the trunk railway is merely a dream inasmuch as any South American line would run towards Panama has not encouraged its few remaining and mostly unavowed opponents. It is fully recognized (1) that British Guiana offers the easiest route (2) that South America will have eventually as many trunk lines as North America and that the costly mountain railways necessary to connect Brazil with Panama will no doubt follow in due course the construction of our own pioneer line.

APPENDIX II.

EDITORIAL NOTE.

The following is taken from our issue of May, 1915, which has long been out of print. We feel it advisable to reproduce it as the last tangible contribution to the subject. The memorandum on which it is based would no doubt require considerable revision in view of the con-

sequences likely to result from the war and the abolition of the old indenture system. In essentials, however, the position will be the same. While we contend that the idea is erroneous that either money or credit will be lacking after the war except during a short purgatorial period of reconstruction and slump, it is unlikely that money will be raised for some time at less than five per cent. This means an increase of the Editor's estimate of £77,329 by about two-fifths viz., to about £110,000, as the annual amount for which the colony would be liable after the twelfth year for railway and colonization schemes.

The Secretary of State's despatch, which arrived after the Committee reported, asked for information as to the possible traffic and laid down as an essential for imperial financial assistance "ultimate financial control" of the colony by the Home Government. There are many ways of securing such control and it does not necessarily imply a surrender of our very old-fashioned constitution, which cumbrous and illogical as it is, has still many adherents. We doubt the advisability of complicating the difficult problem of opening up the colony by any political or constitutional issues beyond the simple question of how to secure ultimate financial control for the financially predominant partner. The Railway Committee has not sat since the outbreak of the war and the information asked for by Viscount Harcourt has yet to be supplied.

We have no doubt that His Excellency Sir Wilfred Collet, when the progress of the Rupununi cattle-track has furnished him with preliminary data, will not overlook this matter and it may lead to the addition of a Railway and Development Committee to the list of Committees appointed on August 1st, 1917.

THE HINTERLAND RAILWAY COMMISSION'S REPORT AND ACCOMPANYING MEMORANDUM.

From Timehri, Vol. 3, p. 199.

The Committee appointed to discuss His Excellency Sir Walter Egerton's Despatch No. 5 of the 5th January, 1914, to the Secretary of State for the Colonies with respect to a railway into the hinterland of this colony, met on Monday, the 20th April, 1914, in private. The members present were :—

The Hons. C. Clementi, M.A., Government Secretary ; J. J. Nunan, K.C., Attorney General ; J. Hampden King, Immigration Agent General ; D. M. Hutson, K.C., and J. B. Laing, members of the Executive Council ; the Hons. E. C. Buck, A.M.I.C.E., Colonial Civil Engineer ; J. P. Santos ; F. Dias, A. P. Sherlock and C. F. Wieting, members of the Legislature ; Mssrs. C. W. Prest and J. S. McArthur, Mayor of Georgetown, Financial Representatives ; J. A. Abbensetts, Mayor of New Amsterdam, J. Cunningham, representing the Royal Agricultural and Commercial

Society; J. Duke Smith, representing the Chamber of Commerce; J. Gillespie, representing the Planters' Association; and A. F. White representing the Balata Industry.

The Honourable J. B. Laing was proposed as chairman by the Honourable the Government Secretary, and was unanimously elected. After considerable discussion it was proposed, and unanimously carried, that a Sub-Committee be formed to go into the whole question and formulate resolutions for discussion at the Committee's next meeting.

The following gentlemen were appointed members of the Sub-Committee:—

The Hons. J. B. Laing, Chairman; C. Clementi, J. J. Nunan, J. Hampden King, E. C. Buck, and A. P. Sherlock, Messrs. C. W. Prest, J. S. McArthur, and J. Duke Smith.

The Sub-Committee held two meetings and drafted ten resolutions which were submitted at the meeting of the Committee held on Monday, the 4th May, 1914, when all the members (including Mr. Duncan, Mr. Downer, Dr. Rohlehr, Mr. Wreford and Mr. Rice, who were absent from the first meeting of the Committee) were present, except Mr. C. F. Wieting who had left the colony in the interval.

Considerable discussion in public took place on the resolutions and several amendments thereto were passed.

The resolutions as amended and unanimously adopted, are as follows:—

1. This Committee strongly supports the proposal to construct a Hinterland Railway if combined with a colonization and development scheme; and recommends:—

2. That work on the railway shall be open to all labourers free in the colony.

3. That immigrants under contract be imported yearly for the first five years to replace the labourers withdrawn from the coastal and river districts for work on the Railway and for taking up land under the colonization scheme.

4. That the railway shall be of metre gauge so as to allow of trans-continental railway communication without change of engine or carriage.

5. That the question of whether the railway should be built by the Government or by contractors be left to His Majesty's Government for final decision.

6. That the Secretary of State be asked to sanction a loan aggregating £2,000,000—at lowest possible rate of interest, of which loan £1,400,000 be allocated for railway construction, deficit on working

expenses for eight years, colonization and development of the hinterland, and £600,000 for development of the coast and river districts and meeting expenses in connection with the withdrawal of labour.

7. That the starting point of the railway shall be Georgetown, and not Wismar or some other place up the Demerara River.

8. That the question of the Constitution be not dealt with by this Committee, there being at present no information before us as to whether or not the Secretary of State will raise this point as one of the conditions for allowing the loan asked for.

9. That the portion of the loan allocated for coastlands and river districts development shall be repaid as follows:—

First three years nothing, after three years the interest on full amount plus the deferred interest for three years plus sinking fund for, forty-seven years on total of loan and accumulation of interest.

That the amount set aside for railway construction, colonization development of the hinterland and deficit for working expenses during first eight years be paid as follows:—

First eight years nothing will be paid—after 8 years half interest on the £1,400,000, after sixteen years full interest on the whole amount plus interest for first eight years deferred, plus deferred half interest on second eight years, plus sinking fund on entire amount for thirty-four years—or on such other terms as the Secretary of State may see fit to allow taking into consideration the financial position of the colony.

10. The loan to extend over a period of fifty years.

The Committee were unanimously in favour of the Hinterland Railway being eventually linked up with the railway in Brazil, and a strong point was made that, if there was to be a railway at all, the industries of the coast and river districts must be safeguarded as respects labour withdrawn from those districts for the railway and for colonization of the hinterland.

The Committee further specially emphasise the fact that there must be colonization and development schemes for the coast and river districts, side by side with any scheme for a railway to, and development of, the hinterland of the colony.

The Committee ask that a Copy of this report be forwarded to the Secretary of State for the Colonies by the first opportunity.

MINORITY REPORT.

We, the undersigned members of the Committee appointed to discuss Your Excellency's Despatch No. 5 of the 5th January, 1914, have with-

held our signatures from the majority report, because in our opinion the construction of a hinterland railway should not be made conditional on a colonization and development scheme for the coast and river districts.

We agree with the majority report that the industries on the coast and river districts should be safeguarded so far as possible with respect to labour withdrawn from those districts during the construction of any railway.

We strongly hold the view that in the event of the Secretary of State declining to make a loan of the amount set down for the development of the coast and river districts, His Majesty's Government should nevertheless be asked to sanction a loan on the terms suggested in Your Excellency's despatch with which we entirely concur.

Respectfully submitted,

CECIL E. RICE,

A. F. WHITE.

MEMORANDUM BY MR. NUNAN FOR THE COMMITTEE AND
SUB-COMMITTEE ON RAILWAY MATTERS.

The whole question turns upon what proposal to contribute and repay we are able to make to the Secretary of State. He is unlikely to consider a mere grant and we must advance a basis of discussion and negotiation.

Can this Committee help the Governor in this matter? His despatch of 5th January implies that the Colony is to assist in the enterprise, paras. 11 (c), 12 (b) and 30. I have been asked to circulate the proposals made in my speech to the Committee at its opening meeting, 20th April, and now do so.

My proposal is that we should put railway loan of $1\frac{1}{4}$ M. Stg. plus deferred interest, interest and Sinking Fund on a separate basis from a Development loan of $\frac{3}{4}$ M. Stg. plus deferred interest, interest and Sinking Fund and ask the Secretary of State to help us as regards both.

(1.) I wish to emphasize that we have only Mr. Bland's figures to go on and are not a body of experts ourselves. Whatever doubts we may have as regards under or over estimates of costs or profits in details there is nothing to be gained by dwelling on them at the moment. When a detailed survey is made the estimates can be re-adjusted. At present we should be only wasting time in trying to criticise the only expert basis of discussion we have.

(2.) If a through route is successfully constructed harbour construction will be easily managed. Capital will flow in for a loan to improve a

harbour having a trunk-line terminus. We can postpone consideration of this. Harbour improvement will not be urgent without a through route. Three years hence is time enough.*

(3.) Sea Defences we should deal with either by a loan on some separate basis or out of our developing resources. Some contribution (say £50,000) might be made from the Development loan.

(4.) Deficit on Working Expenses, *i.e.*, over and above capital charges. Mr. Bland's figures are a deficit of £10,000 after the first five years. I think he has under-estimated returns if the route is to be a through route. If there is a deficit it can be provided for out of current revenue but I do not think there will be one.†

The Scheme is based on fifty years amortization and repayment as required by the Colonial Loans Act, 1899.‡

(1) *Re* RAILWAY LOAN (1½ MILLIONS STG.).

We ask the Secretary of State to carry us entirely for the first six years, as to half for the ensuing six years, finding the deferred interest as it becomes due and making no provision for Sinking Fund for twelve years. After twelve years we pay the whole interest plus interest on the funded deferred interest, plus Sinking Fund on the total amount spread over 38 years. Labour for the Railway should be looked for to West Indian and local negroes, the most suitable for that class of work. No restriction should be attempted in the movement of labour.

(2) *Re* DEVELOPMENT LOAN (¾ MILLION STG.).

We ask the Secretary of State to carry us for three years and we then undertake to repay loan and deferred interest in 47 years. This might be altered to four or even five but three should do.

This is only a suggestion not a hard and fast scheme. Both number and period of indenture may be varied.

Four thousand families or possible families, *i.e.*, groups of two consisting of not less than one adult person of each sex (East Indians or Chinese) married or of marriageable age indentured for three years on the coast properties, should be brought in at Government expense. At £30 per "family" this would cost £120,000 a year for five years.

*NOTE.—In the four years that have passed since the above was written the Bar has not improved and in default of any larger scheme, which the expense might not justify in the present conditions of our shipping trade, immediate dredging operations are indispensable and will be found adequate for the next five years.

† NOTE.—Mr. Prest has called my attention to the fact that Mr. Bland's estimate overlooks the first five years. (The deficit on the first five years should be charged to capital required for the railway.)

‡ By this Act interest must be at such a rate as will save the Fund from actual loss and must not be less than 2½%. The price of our money must be fixed by English market conditions. Consols now stand at 75 to 76 and many Colonial Loans are being issued at 99 for 4%. The interest mentioned is a rough approximation based upon what our money would cost us. The loan must be satisfactorily secured by the local legislature.

It would replace the labour attracted to the railway and supplement the present indenture. The 4,000 families brought in during the fifth year would have indentures running to end of seventh year. The sugar and other plantations and industrial interests on the sea coastlands would be substantially protected from loss during the years of construction, extension and the excitement of any gold discoveries. The coastlands would be developed by the settlement of the imported labour when free.

£150,000 should be set aside to provide suitable lands for settlement at the end of the period of indenture. Of this £50,000 might be spent on any urgent sea defences necessary for the purpose of empoldering the lands required for development. This empoldering scheme would benefit the coast population in general.

It should be noted that under this scheme there would be 40,000 adults, mostly married couples, not reckoning children in the fifth year and that each person would be paying directly or indirectly nine or ten dollars to the public revenue or \$360,000 per annum or more than double the amount of the annual interest and Sinking Fund on this head. Present colony revenue is about \$9 per head, paid chiefly in indirect taxation. With prosperity, consumption of taxable commodities would increase, also taxable capacity.

At the beginning of the fourth year we should have 16,000 families (4,000 time-served) paying nearly \$300,000 to the revenue or more than enough to pay the interest, deferred interest and Sinking Fund on this Development Loan.

PRIVATE RAILWAY SCHEME.

There is another question to consider and that is the possible refusal of the Secretary of State to consider a Government Railway on the ground that we cannot afford the expense and the risk.

In that case we should ask the Secretary of State to help us to secure the construction of a leased Government railway* or of a private railway by a reliable firm of contractors on the most advantageous terms possible to the Colony based upon land grants and a limited number of years' subsidy. The terms asked by Colonel Link's supporters were 10 years at 3½ per cent. These terms are hopeless to expect now. In Brazil the railways are built on a 25 years' subsidy of 5 per cent. But we could do better than that on a British Imperial guarantee. I think 15 to 20 years at 4 per cent. would secure what we require. On Mr. Bland's figures of 1¼ millions, interest (spread by amortization over fifty years) would amount to roughly £40,000 a year, but I have not worked out this last figure by tables.

* NOTE.—The construction of a railway by the Government and its subsequent transfer to a private Company for working purposes in an expedient that has been successfully tried in other places. The proposal of the Editor as Chairman of the Demerara Railway Committee published in another appendix is based on the same principle.

FIGURES.

It should be noted that the figures set out below, which make no pretence to official authority or to actuarial skill, would be somewhat reduced in a calculation allowing for the fact that the Development loan would not be fully called up until the beginning of the fifth year nor the Railway loan until the beginning of the fourth. On the other hand the annual interest on deferred interest as it accrues, *i.e.*, compound interest is not taken into account so that I have made a rough balance. The calculation can also be worked out in other ways, *e.g.*, on the basis of deferred payments and at the expiry of the free period payment of a Combined Sinking Fund comprising all interest charges. The main point is to give the people of the colony some reasonably accurate idea of what their ultimate liability will be. The figures have been checked by Mr. John Bollers to whom I take this opportunity of expressing my sincere thanks.

DEVELOPMENT.

<i>First Three Years.</i>	<i>After Three Years.</i>	<i>After Six Years.</i>	<i>After Twelve Years.</i>
Nothing.	(a) £23,437 being interest at $3\frac{1}{8}$ per cent. on $\frac{3}{4}$ M. Stg.	Do.	Do.
	(b) Plus interest on £70,311 being three years deferred interest, viz., £2,197.	Do.	Do.
	(c) Plus Sinking Fund for 47 years on $3\frac{1}{2}\%$ basis on total of loan and accumulations on interest—£7,111.	Do.	Do.
	Total £32,745 for interest and Sinking Fund.		

RAILWAY.

<i>First Three Years.</i>	<i>After Three Years.</i>	<i>After Six Years.</i>	<i>After Twelve Years.</i>
Nothing.	Nothing.	Half interest on loan of $1\frac{1}{4}$ M. Stg. at $3\frac{1}{8}\%$ £19,531.	(a) Full interest on $1\frac{1}{4}$ M loan £39,062. (b) Plus interest on £234,372 amount of first six years deferr- ed interest, viz., £7,324. (c) Plus interest on 2nd six years defer'd £117,186 viz., £3,662. (d) Total on foot of Sinking Fund for 38 years at $3\frac{1}{2}\%$, £27,281.
			Total £77,329.

NOTE.—Sinking Fund is calculated on the assumption that we can get $3\frac{1}{2}$ per cent. for our money. We could probably do better. We might also get our loans at a little less than $3\frac{1}{8}$.

NOTE BY MR. NUNAN, AFTER FIRST MEETING OF SUB-COMMITTEE.

The Immigration Agent General thinks £35 per "family" of two would be nearer the amount of cost. (In the case of Chinese we shall have the advantage of the Panama Canal after the current year). He also thinks that there may be difficulty in carrying on two systems of indenture with different periods, viz., five years and back passage for the old system, three without back passage but with land grant for the supplementary and temporary system. He thinks a scheme based upon the actual indent of the proprietors offers more advantages, for instance an agreed indent and a free importation of twice as many as are indented for on the old system.

Hon. A. P. Sherlock further thinks 4,000 "families" or 8,000 adults a year might be more than the estates could handle, mentioning hospital and housing requirements. Both suggest 5,000 adults a year, the sexes being about equal in numbers.

These are details which only the Immigration Department and the planters can work out. The main point is the sum to be asked for and the method of application. This must be a fixed sum for the specific purpose of coast labour and colonization, to avoid subsequent complaints of unfair application and to enable the situation to be faced as a whole. The object is to provide indentured labour for the coastlands to replace any special drawing away of labour entailed by railway and development

in the far interior. The further aim is to secure a suitable population for the coastlands which ought to be prepared for colonists by irrigation and drainage under Government schemes.

LATER.

The Scheme actually recommended by the Sub-Committee adopts the principle and the periods set out above but allocates £150,000 out of the Development Loan of $\frac{3}{4}$ million stg. to the Railway Loan for settlement on the lands in the interior, thereby supplementing His Excellency's proposal of £50,000 for those lands. £600,000 remains earmarked for the Coast labour and colonization. The figures given above will have to be re-adjusted accordingly, making payments on the Coast development loan begin at £26,523 in the fourth year and increasing to £21,875, the Railway payments to begin after the sixth year. The later figures after the twelfth year will have to be correspondingly adjusted. The total for both loans will not be much different from our present estimate. Any deficit on working expenses is not contemplated after fifth year from opening of railway. As against expenditure we shall be able to reckon increased population on coast and interior savannah, general development and railway connection with Brazil.

CALCULATIONS ON BASIS OF £600,000 FOR DEVELOPMENT.

<i>First Three Years.</i>	<i>After Three Years.</i>	<i>After Six Years.</i>	<i>After Twelve Years.</i>
Nothing.	(a) £18,750 being interest at $3\frac{1}{8}\%$ on £600,000.	Do.	Do.
	(b) Plus interest on £56,250 being three years deferred interest, viz., £1,757.	Do.	Do.
	(c) Plus Sinking Fund for 47 years on total of loan and accumulation on interest—£5,201.	Do.	Do.
	Total £25,708 for interest and Sinking Fund.		
If after 4 years then—			
	(a) £18,750		
	(b) £ 2,343 being interest on £75,000 4 years deferred interest.		
	(c) £ 5,430 Sinking Fund 46 years.		
	Total ... £26,523		

RAILWAY, £1,400,000 (INCLUDING £150,000 ADDITIONAL FOR DEVELOPMENT.

<i>First Three Years.</i>	<i>After Three Years.</i>	<i>After Six Years.</i>	<i>After Twelve Years.</i>
Nothing.	Nothing.	Half interest on loan—£1,400,000 at 3½%—£21,875.	(a) Full interest on loan— £43,750. (b) Plus interest on £262,500 amount of first six years deferred interest, viz., £8,203. (c) Plus interest on 2nd six years deferred, viz, £4,101. (d) Total on foot of Sinking Fund, £23,286 S. F. 38 years.
			Total... £79,340.

APPENDIX III.

THE DEMERARA RAILWAY COMMITTEE OF COMBINED COURT.

CHAIRMAN'S SUGGESTED SCHEME OF GOVERNMENT CONTROL.

The suggested Government Control Scheme in connection with the Demerara Railway prepared by the Hon. J. J. Nunan, K.C., Chairman, (14th June, 1918), is as follows:—

1. The Company to submit the question of its suitable recapitalization to a Commission consisting of equal numbers of representatives of the Colony and the Company. This Commission would be assisted by actuarial and engineering experts in railway valuation.

On the adoption of its report the Company (a) to take the necessary legal steps to reduce the capital to the amount advised, consolidating its various classes of shares, or, (b) if its shareholders prefer, will leave the present form of capitalization untouched but will treat the calculated amount as its capital for the Government's purposes.

2. The Government to undertake during the statutory duration of the present subsidy in lieu of the subsidy to guarantee say four or four and a half per cent. on the reduced capital or calculated amount.

3. The Railway Company to assign the reduced shares or otherwise to assign for the same period the control of the Company to the Government.

4. The Government to lease the Railway to the Company for working purposes under a Board of five Directors containing representatives of both the colony and the shareholders.

5. All revenues over and above working expenses to be paid to the Government on terms to be agreed upon.

(a) towards the cost of the guarantee ;

(b) towards development expenditure.

6. Additional development capital to be provided by the Government as required on a basis to be agreed upon.

7. At the end of the period of present subsidy (say thirty years) the railway to revert to the Company or to be taken over by the Government on terms to be provided for. Extensions at Government expense to be leased to the Company or to be retained by the Government.

INTEREST GUARANTEED ON PROPER CAPITAL.

Under this outline, it will appear that no large amount by way of purchase money would have to be raised by the Government ; the Company, relieved of any dilution of stock or share values, will have an interest guaranteed on its proper capital. The management would be free, subject to Government control, to incur expenditure for development purposes, instead of having to devote all revenue over lowest possible running charges to the more or less hopeless work of paying a dividend on a capitalization based partly upon the values of 1846. Recent American and Canadian experience in consolidating or taking over railways including the taking over of the Canadian Northern and Quebec Railways by the Canadian Government, and British war experience in State control of private railways will be useful in working out this scheme.

APPENDIX IV.

ROMAN-DUTCH LAW IN BRITISH GUIANA AND A WEST INDIAN COURT OF APPEAL.

From the *Journal of the Society of Comparative Legislation*,
November, 1917.

[Contributed by J. C. LEDLIE, ESQ.]

On January 1, 1917, the Civil Law of British Guiana Ordinance, 1916 (which was passed on September 2, 1916), came into operation

in British Guiana. The event marks an important and decisive stage in the checkered history of the Roman-Dutch Law in the Colony.¹

It is well known that, when the Dutch settlements of Demerara, Essequibo, and Berbice (which were afterwards constituted the Colony of British Guiana) passed definitely under British rule in 1814, the existing local laws and usages were, in accordance with the British policy usual in such cases, left undisturbed. The law thus retained, which is known in the Colony as "the common law," was a form of the Roman-Dutch law:² that mixed system of Germanic and Roman law which grew up in the Low Countries in the seventeenth and the first half of the eighteenth century (*i.e.*, during the period of the greatest commercial prosperity of the Dutch), and was carefully worked out, and scientifically developed, in the writings of Grotius, van Leeuwen, Voet, and other very eminent Dutch jurists.³ "It was," says the Report of the Statute Law Committee, upon whose report the enactment was based, "a highly organized and flexible system of common law which, but for the special conditions of the Colony, would have proved as suitable for all commercial and social requirements as a similar form of jurisprudence has done for . . . South Africa." Some of these "special conditions" are fully explained in the Report; others are implied rather than stated. Together they form an interesting and instructive bit of legal history.

The Commission of 1824—Soon after the settlements had passed under British rule, there was serious trouble with regard to the administration of justice in the Colony, and more particularly with regard to criminal procedure. In 1824 a Commission was accordingly appointed "to inquire into the administration of criminal and civil justice in the West Indian and South American Colonies." The recommendations of the Commission were mainly concerned with criminal procedure, a department of law in which the divergence of principle between the Roman-Dutch law and English law would naturally be most pronounced.⁴ As regards the civil law, however, *i.e.*, the Roman-Dutch substantive law, the Commission cited the opinion of the highest local authorities to the effect that it was simple and well adapted to the wants and

¹ The way had been prepared for the enactment of this Ordinance by the publication in 1916 of the Report of the Statute Law Committee appointed by the Governor of British Guiana in November, 1914, to advise as to the best means of giving effect to the recommendations made by the so-called Common Law Commission in their Report printed in April, 1914.

² For fuller details of the history of Roman-Dutch Law in British Guiana reference should be made to Professor R. W. Lee's article in vol. xiv. (p.11) of this journal; and also to Dr. Bisschop's Article on "Modern Roman-Dutch Law" in the *Law Quarterly Review*, vol. xxiv, p. 157.

³ See R. W. Lee, *Introduction to Roman-Dutch Law*, Clarendon Press, p. 14 ff.

⁴ For fuller information as to the early history of criminal procedure in the Colony reference should be made to the above-mentioned article by Professor Lee (pp. 12, 13). The Report of the Commission was only signed by one Commissioner (Mr. Jabez Henry), the other two having died in office.

usages of the people," the President of the Courts of Criminal and Civil Justice of Demerara and Essequibo expressly declaring that he "admired the principles of the civil law." The Roman-Dutch common law, the "highly organized and flexible" legal system, accordingly continued in force, and proved, for the time being, quite adequate to the demands made upon it.

Gradually, however, the conditions of the Colony underwent a material change. The English population increased; the resident Dutch dwindled away. "We have no resident Dutch population," says the Report of the Common Law Commission of 1914,¹ "and few even of the Dutch names survive." The population, moreover, though small (some 312,000), became very mixed in race. Besides a native Indian population, there was a considerable influx of Indians from British India. "East Indians and Portuguese make up some 50 per cent." And at the same time, trade, especially with the West Indies and Great Britain, expanded. Thus new economic conditions came into being, and it became necessary to adapt the local law to their requirements. How could this be most satisfactorily accomplished?

Two methods seemed available. The first was to stand by the Roman-Dutch law as the common law; to adhere, as far as possible, to its principles (its "simple" principles); to endeavour to develop it gradually from within, and, by patent piecework, to fit those principles to the novel conditions as they arose. It might doubtless be found convenient from time to time to supplement from outside, *i.e.*, from English sources, but the system to be evolved by this method would be, in the main, an independent, a home-grown legal system.

What were the prospects of success for such a method? Were the "special conditions" of the Colony favourable to its satisfactory operation? On the facts as stated in the Report of the Common Law Commission, the answer to this question must, we think, be in the negative.

The Interpretation of the Law.—The fruitful working of the method in question requires that the law shall be handled with sympathy and with understanding; those charged with the administration of the law must be in full accord with its characteristic spirit. Such was the case with our own common law. Such, again, was the case—in a different way—with the Roman-Dutch-common law in South Africa.² In British Guiana the position was different. There the administration of the law was in the hands of English-trained lawyers. The atmosphere of the

¹ See *Supra*, p. 62.

² Accordingly when the British Guiana Government in 1912 consulted the South African Government as to whether it was proposed to make any change in the South African common law, the reply was "emphatic" to the effect that the Roman-Dutch law was "eminently suitable," and that "the necessity for the substitution of English law had never been seriously entertained."

Courts was predominantly English. The language was English; the pleadings, the evidence, the arguments were in English. And for English-trained lawyers, the Roman-Dutch system, with all its virtues, could not fail to be somewhat of an alien system. It had no prestige of national tradition to back it. "The colonists," says the Report of 1914 (p. 20), "have no sentimental affection for any legal legacy of the Batavian Republic of 1803 or the Kingdom of the Netherlands of 1814." It was, moreover, contained in books—some of them between 200 and 300 years old—which were written in a foreign tongue (Latin or Dutch), and were often difficult of access, whether in the original or in translation.¹ That in such circumstances there should be some lack of sympathy between the spirit of the law to be administered and the administering authorities is hardly matter for surprise. True, there was no want of appreciation of the great merits of the Roman-Dutch law—its lucidity, its simplicity, its "scrupulous reverence for local usage."² If there were, as one of the witnesses before the Commission stated, judges who tried "to approximate it to English law as much as possible," there were others who were "particularly wedded to the Roman-Dutch law and always stick out for it." But however genuine the admiration for the great qualities of the "common law," and however sincere the endeavour to apply it in a manner conformable to its true spirit, it was almost impossible for English lawyers not to import into their administration and interpretation of the law much of that particular bias of thought and of those habits of reasoning which a schooling in a widely different system had instilled into their minds. To take only one illustration the principle of *stare decisis* has, as Dr. Bisschop (in the before mentioned article) has reminded us,³ no place in the Roman-Dutch system; that is to say, decided cases are never (as with us) *sources* of legal rules, and, as such, "authoritative" and binding, but are merely examples, or illustrations of the *application* of legal rules.⁴ This is an important divergence of principle, and though it would doubtless be easy to exaggerate the practical effects of the divergence, still it represents a difference of mental attitude which would render it difficult for a lawyer trained in one school readily to accommodate himself to methods of reasoning accepted in the other.

If, then, the special "conditions" of the Colony were adverse to the healthy growth of the Roman-Dutch law; if they tended to check its

1 As long ago as 1828 the lack of "good translations of the Dutch authorities" was animadverted on, and the Report of 1914 (p. 28) puts in a plea for securing for the Colony "a set of the leading legal and historico-legal authorities." In British Guiana, moreover, there are no text-books, no written records of judgments of earlier date than 1856, and no reports (Professor Lee, *op. cit.* p. 22).

2 Report of 1914, p. 10. "Personally, said one barrister witness before the Common law Commission, "I think that the Roman-Dutch law as regards equity is very equitable indeed,"

3 See also the Report of 1914, p. 5.

4 "Non exemplis sed legibus indicandum est." The fact mentioned may account partly for the lack of Law Reports in British Guiana to which reference has already been made. Where decisions have no binding force for the Judges, there is not the same incentive for reporting them as there is under our system.

natural development and to prevent it from putting forth its full strength ; was there any other method of adopting the law of the Colony to changing circumstances more in harmony with its special needs ? This was the problem that confronted the colonial authorities, and the method that commended itself to them as an alternative was to substitute English statute and common law for the Roman-Dutch law. If the latter could not be mended, it might perhaps be ended.

The actual course of events was briefly as follows. Until about 1890 the two methods of development operated concurrently, not indeed as settled policies, but as streams of tendency. In the 'nineties however, the second method definitely gained the upper hand, and the policy of "ending" the Roman-Dutch law became the "accepted policy" of all parties.

The Displacement of Roman-Dutch Law.—Thus, while the general effect of the legislation between 1830 and 1890—the Report of 1914 enumerates some ten Ordinances that altered the law and practice of the Colony between those dates—was to assimilate British Guiana law more closely to English law, the ruling principles of the Roman-Dutch law were not seriously affected, except in the important case of the Ordinance No. 6 of 1864, which introduced English mercantile law wholesale, and constituted the first conspicuous example of the second method of development.¹ After 1890 the "accepted policy" gathered momentum. In 1891 the English Interpretation Act was introduced. Ordinances of 1891 and 1900 largely displaced the common law as to bills of exchange insolvency and partnership in favour of the English law on those subjects. In 1904 the old Roman-Dutch (not Roman) principle of community of goods between married persons was swept away. In 1906 the Wills Ordinance introduced the English law as to the execution and attestation of wills. In 1909 the heir was deprived of the character of "universal successor" which the old Roman law had assigned to him, and in the same year the English common and statute law of fire and life insurance was introduced *en bloc*. In 1914 the Sale of Goods Act, 1893, came into force in the Colony.²

¹ "From and after the commencement of this Ordinance, all questions arising within this Colony relating to the following matters, namely—ships and the property therein and the owners thereof, and the behaviour of the master and mariners, and their respective rights, duties, and liabilities as regards the carriage of passengers and goods by ships ; stoppage *in transitu* ; freight ; demurrage ; insurance ; salvage ; average ; collision between ships ; bills of lading ; and all rights, liabilities, claims, contracts, and matters arising in respect of any ship, or any such question as aforesaid, shall be adjudged, determined, construed, and enforced according to the law of England applicable to such or the like case." English Company law was introduced from time to time shortly after the enactment of the English legislation on the subject.

² The effect was to sweep away (as far as the sale of movables was concerned) a whole group of principles of the Roman-Dutch law. As the Report (p. 19) points out, the Roman-Dutch law recognised no vendor's lien (since property did not, without more, pass from the unpaid vendor till payment). There was no stoppage *in transitu* ; no doctrine of "caveat emptor" ; the vendor is not bound to pass ownership, but only to guarantee undisturbed possession ; the risk passes to the purchasers independently of delivery for payment, even where property has not passed. All these rules were swept aside.

The result of all this comprehensive legislation was to leave the Roman-Dutch law, in the words of the Report, a mere "husk," a "skeleton, a "shattered remnant." But though a remnant, it still retained vitality enough to cause much trouble and perplexity in the administration of the law. For it continued in force except where displaced by Ordinance, and since the various Ordinances above mentioned were passed, not on any definite system, but rather piecemeal, as the exigencies of the time seemed to call for them, and without reference to the provisions of the Roman-Dutch law which they superseded, the relation between the new (English) law thus imported and the existing (Roman-Dutch) law was often a matter of great difficulty to determine, and the resulting confusion and uncertainty was considerable. "We have," says the Commission's Report (p. 20), referring to the co-existence of two heterogenous elements in the legal system, "all the disadvantages of a mixed system without the elasticity of the Roman-Dutch jurisprudence."¹

The Commission of 1912-14.—It was in these circumstances that the Acting Governor of British Guiana² on June 4, 1912, appointed the before-mentioned Commission under the Chairmanship of the Hon. J. J. Nunan (then Solicitor-General, afterwards Attorney-General of the Colony), "to inquire and report whether any changes in the common law of the Colony are advisable, and whether such changes, if any, should be made by the substitution of English law [for Roman-Dutch law] or otherwise." The Commission held seven public sittings in May and June, 1913, for the hearing of evidence. The witnesses were nearly all practising lawyers or legal officials. The line of examination was much the same with all. They were invited to give their opinion on a number of legal matters as to which doubts and difficulties had arisen in the local administration of the law. They were also asked their views as to the salving of what remained of the common law. There was no serious divergence of view among the witnesses. "The expression of opinion," says the Report (p. 21), "in favour of the English common law has been practically unanimous, the qualifications of two or three witnesses being confined . . . to the support of the Roman-Dutch law in the abstract, or to expressions of doubt as to the possibilities of effecting immediate radical change in a satisfactory manner." The Report, which is a document of considerable legal and historical interest, gives an account of the Roman-Dutch law in general and traces its history in the Dutch settlements prior to the British occupation. It then proceeds to describe what is called "the legal epochs" of the Colony subsequent to the occupation. After giving a summary account of the proceedings before the Commission appointed in 1824, it enumerates the principal alterations made in the law of the Colony from 1828 onwards, with special reference to the modifications of the local common law thereby effected, and explains very clearly—with regard, for

¹ We are told of cases where counsel on one side relied on the Roman-Dutch law, counsel on the other side on the English law governing contracts. And such cases must have been of frequent occurrence.

² Sir Charles Cox, K.C.M.G., then Mr. C. Cox, C.M.G.

example, to the doctrines of consideration and *stare decisis*—the uncertainty and confusion in the administration of the law which resulted from the dual system of law and from the methods of legislative amendment hitherto followed. In the result the Commissioners came to the conclusion that no half measures would suffice for placing the law of the Colony on a satisfactory footing. They accordingly made a drastic recommendation in favour of the introduction of English common law “in regard to all mercantile matters, to all domestic relations (including marriage, judicial separation and divorce, the law of husband and wife, parent and child, guardian or curator and minors, and master and servant), to the law of delicts or torts, agency, suretyship, liens, intestate succession, and in fact to all the law of persons, things, obligations, inheritance, and every other description of matters whatsoever not dealt with by legislation, or otherwise expressly exempted.” An important “exemption” was made with regard to land. “The English law of real property,” the Report continues, “should be expressly excluded.” On this point there was absolute unanimity. “We have no desire to introduce the complicated incidents of (English) real property law. Special recommendations were made with regard to a number of heterogeneous legal topics, such as the law of trustees, bills of sale, prescription, intestate succession (“movable and immovable property should be treated alike for all purposes of succession”), legitims, divorce, legitimation *per subsequens matrimonium*, the “Aquilian right” to damages for death caused by negligence, administration, and probate. A special memorandum was devoted to the peculiar local system of conveyancing—the sale, leasing and mortgaging of land—a system (based partly on the Roman-Dutch common law, partly on Rules of Court)) which had been in operation since 1529, and which, with some changes of method, it was desired to retain.¹ Annexed to the Report was a Draft Code called “the Common Law Codification and Reform Bill” for carrying into effect “the more urgent of the measures” suggested by the Commissioners, and the adoption of this Code was recommended.

The Introduction of English Law.—The next step was to put these recommendations into practical shape. To that end the Governor, on November 28, 1914, appointed a Committee (“The Statute Law Committee”), of which Mr. Nunan was again Chairman, “to consider what English statutes should be adopted in the Colony to enable the law to be altered from Roman-Dutch to English.” The function of the Committee, as explained in their own Report, was “to assist in the completion of the scheme (suggested by the Common Law Commission) by the recommendation of such portions of the English statute law as will place the community, as far as possible, in regard to legal rules and principles in general, and especially in regard to the rules and principles of commercial law, on the same footing as the people of England at the present time.” The Report of the Committee was dated July 27, 1915, and was published in 1916. After adverting to the “accepted policy” of introducing the

¹ The system is explained in Professor Lee's *Roman-Dutch Law*, p.p. 128 ff. and 184 ff.

common law of England and abolishing the Roman-Dutch law "except as to certain subjects which are to be dealt with by Ordinance," they referred to the difficulty of their task "in view of the hitherto uncharted character of the territory" (of the local common law), and proceeded to examine the position of sundry British Colonies in which, at some time, foreign law had been in force, and the method adopted by them for the purpose of introducing English law in its place—without, however, finding any very helpful precedent. After deprecating "the introduction in bulk of a large number of English statutes among a population unacquainted, as a whole, with the older English legislation," and unanimously endorsing the view of the Common Law Commission as to the inadvisability of introducing the English Law relating to immovable property (including mortgages and servitudes thereof), they proceeded to state the practical conclusions at which they have arrived. With a view to creating, if possible, "a starting point" for dealing with the situation, they urged the passing of an Ordinance in terms of a draft annexed to their Report. This Ordinance, which was described as a "fundamental law" and was, in fact, a revised and considerably enlarged version of the Bill annexed to the Commission's Report, was entitled "An Ordinance to codify certain portions of the Roman-Dutch Law of the Colony, and in other matters to substitute the English Common Law and Principles of Equity along with certain English Statutory Provisions for the Roman-Dutch Law." The short title was "The Civil Law of British Guiana Ordinance, 1916." It was a remarkably comprehensive and variegated piece of legislation. Its effect can best be described in the words of the Committee's Report, at page 7 :

[It] (a) abolishes the Roman-Dutch law ; 1 (b) introduces the English common law except as to real property ; (c) places movable and immovable property under the English law of personal property, except as to seven specified points ; (d) adopts a form of the Prescription Act, 1832, and the Real Property Limitation Act, 1874, and vests the foreshore in the Crown ; (e) codifies the law of intestate succession along the lines of the Statute of Distribution, 1670. . . and Intestates' Estates Act, 1890, modified in favour of the equality of males and females and the rights of illegitimates as recommended by the Common Law Commission ; (f) deals with wills, charities and gifts in accordance with the Wills Act, 1837, and other English statutes, adapting the Thellusson Act, 1800, and the Accumulations Act, 1892, and including by reference the preamble to 43 Eliz. c. 4 as regards charities ; (g) preserves the Roman-Dutch legitimation *per subsequens matrimonium*, and abolishes the *annus luctus*, *lesio enormis* and the Roman-Dutch "exceptions" of excussion and division, and similar pleas ; (h) incorporates the Trustee Acts, 1893 and 1894, the Habeas Corpus Act, 1679, the section of the English Judicature Act, 1873, making choses in action assignable, the Slander of Women Act, 1891, and 3 & 4 Will. IV. c. 41, s. 52, giving a right of action against executors for injuries to property by the deceased for six months prior to the death, and (i) adopts the principles of the Lunacy Act, 1890, by giving the Supreme Court control over the persons and property of lunatics.

1 This requires some qualification, as we shall see presently.

It adapted some seventeen English Acts in whole or in part, and included by reference four others. "Its consequences," says the Report (p. 9), "are meant to be very far-reaching."

This "fundamental law" formed the groundwork of the reform recommended by the Common Law Commission. In addition the Committee submitted ten supplementary bills dealing with various subjects to which the Commission had called attention, viz. 1. infants; 2. divorce; 3. carriers; 4. pledges of movables (bills of sale); 5. documents of titles to goods (Factors Act); 6. arbitration; 7. deeds of arrangement; 8. accidental deaths and workmen's injuries; 9. registration of title; and 10. deceased persons' estates. "The whole scheme," says the Report, "is therefore complete in eleven bills."

It should be added that s. 3 sub-s. 1 of the fundamental Ordinance abolished the Roman-Dutch common law, as such, in very sweeping terms¹, but that sub-s. 4 (a) expressly preserved the (Roman-Dutch principle of absolute private ownership in land, and 4 (b) similarly preserved the Roman-Dutch law as to mortgages of land and real servitudes.

Such was the singular legislative experiment recommended by the Commissioners. In view of the intrinsic merits of the Roman-Dutch common law—which were frankly acknowledged—it might, perhaps, appear to some, at a distance, that the slower and more cautious method of development from within, or, it may be, the patient elaboration of a comprehensive Civil Code—the neighbouring island of St. Lucia suggests a precedent—would offer greater prospects of a successful solution of the problem. That the proposals were unprecedented was freely admitted by the Common Law Commissioners themselves who indeed showed some signs of trepidation on that score. Their appeal to the maxim, "*Communis error facit ius*," was not very encouraging, and it may be open to some doubt whether the Commissioners in the performance of their difficult task acted altogether in the spirit of the passage from Renan cited by them, "The real men of progress are those whose starting-point is a profound respect for the past."

However this may be, the practical administrators on the spot—who must, after all, have the last word in such a matter—appear to have been virtually unanimous in favour of the proposals. The changes, revolutionary as they were, excited neither discussion nor controversy. On the contrary, the publication of the Committee's Report in January 1916, was promptly followed (in September of the same year) by the passing of the Civil Law of British Guiana Ordinance, 1916, which is

¹ "The law of the Colony relating to wills, *fidei commissa*, trusts, suretyship . . . hiring and lease, landlord and tenant, negotiable instruments, bailments, carriers . . . every description whatever of contract and obligations . . . all questions relating to husband and wife, marriage, separation, divorce . . . and the law of the Colony relating to all other matters whatsoever, whether *eiusdem generis* with the foregoing or not, shall cease to be Roman-Dutch law, and as regards all matters arising and all rights acquired or accruing after the date hereof, the Roman-Dutch law shall cease to apply to the Colony."

practically identical with the fundamental Ordinance annexed to the Report. As already stated, it came into operation on January 1, 1917. The die is thus cast and the experiment launched. The results are a matter of speculation. If the experiment fails, it will, at any rate, not be for want of trouble taken. If it succeeds, the administration of law in the Colony will be freed of many perplexities that now beset it.

The West Indian Court of Appeal.

In the Report of the British Guiana Common Law Commission reference is made (p. 21) to a proposal to establish a West Indian Appeal Court. The proposal has been under discussion for some time past, and has been received with widespread sympathy and interest. It has been commended on the very legitimate ground that it would not only tend to improve the administration of law in the Colonies concerned, but would help to "link up the scattered fragments" of the West Indian portion of the Empire, and consolidate and strengthen West Indian interests in the Imperial counsels. After being in abeyance for many years, the suggestion was revived in 1912, and has since been the subject of many interchanges of opinion between the authorities of the Colonies in question.

An important step forward was taken in January, 1916, when ten delegates from the Colonies of Barbados, British Guiana, the Leeward Islands, Trinidad and Tobago, and the Windward Islands, appointed by their respective Governments, met at Port-of-Spain, Trinidad, to discuss the clauses of a proposed Imperial Act, which had been drafted by the Attorney-General of Trinidad, for the purpose of establishing the Court of Appeal "and for purposes ancillary to its establishment." The Conference held four sittings under the Presidency of the Chief Justice of Trinidad, and arrived at substantial agreement on all points of importance but one. The main conclusions come to may be summarised as follows: A Court to be called the "West Indian Court of Appeal" should be set up by Imperial Act for the before-mentioned Colonies, with power to the King in Council to add any other Colony, in or near the West Indies, that desired to be included in the scheme, or to direct that any Colony already included in the scheme should, if it so desired, be excluded therefrom.²

The Court was to be in substitution for, not in addition to, any existing local Court of Appeal. The law to be administered was to be that of the Colony from which the appeal came. The Court was to be ambula-

1 At the time of writing no information has come to hand as to whether the complementary recommendations of the Committee have been carried into effect. Probably they have.

2 In a speech by Mr. Nunan on February 5, 1917 (published in the June, 1917 issue of *Timehri*, the excellent journal of the Royal Agricultural and Commercial Society of British Guiana), it is stated that the Bahamas are now willing to come into the scheme, and that "questions of steamer communication alone postpone Jamaica's accession." It seems probable that British Honduras will follow suit.

tory, with headquarters at Port-of-Spain. The right of appeal to the King in Council was not to be affected.⁽¹⁾ As to the constitution of the Court, it was agreed that it should consist of the Chief Justices of Trinidad and Tobago, British Guiana, Barbados and the Leeward Islands, and the senior substantive Chief Justice of the Windward Islands and that the first-named Chief Justice should be *ex officio* President. But a proposal that the Act should also make provision for the appointment of a "barrister judge" from the United Kingdom revealed great differences of opinion among the delegates, those from Barbados, the Leeward Islands, and Grenada being strongly opposed to the suggestion, on the ground that it was unnecessary and, in any event, too expensive, while the delegates from British Guiana and Trinidad (who urged that the Colonies they represented would probably contribute seven-eighths of the total number of appeals to the Appeal Court) expressed a decided opinion in its favour. It is understood that this question has proved a serious stumbling-block, and has not yet been adjusted. We may, however, venture to express a hope that the obstacle will not prove insuperable.

The total annual cost of the Appeal Court is estimated at about £1,500, exclusive of the salary of any judge brought in from outside.

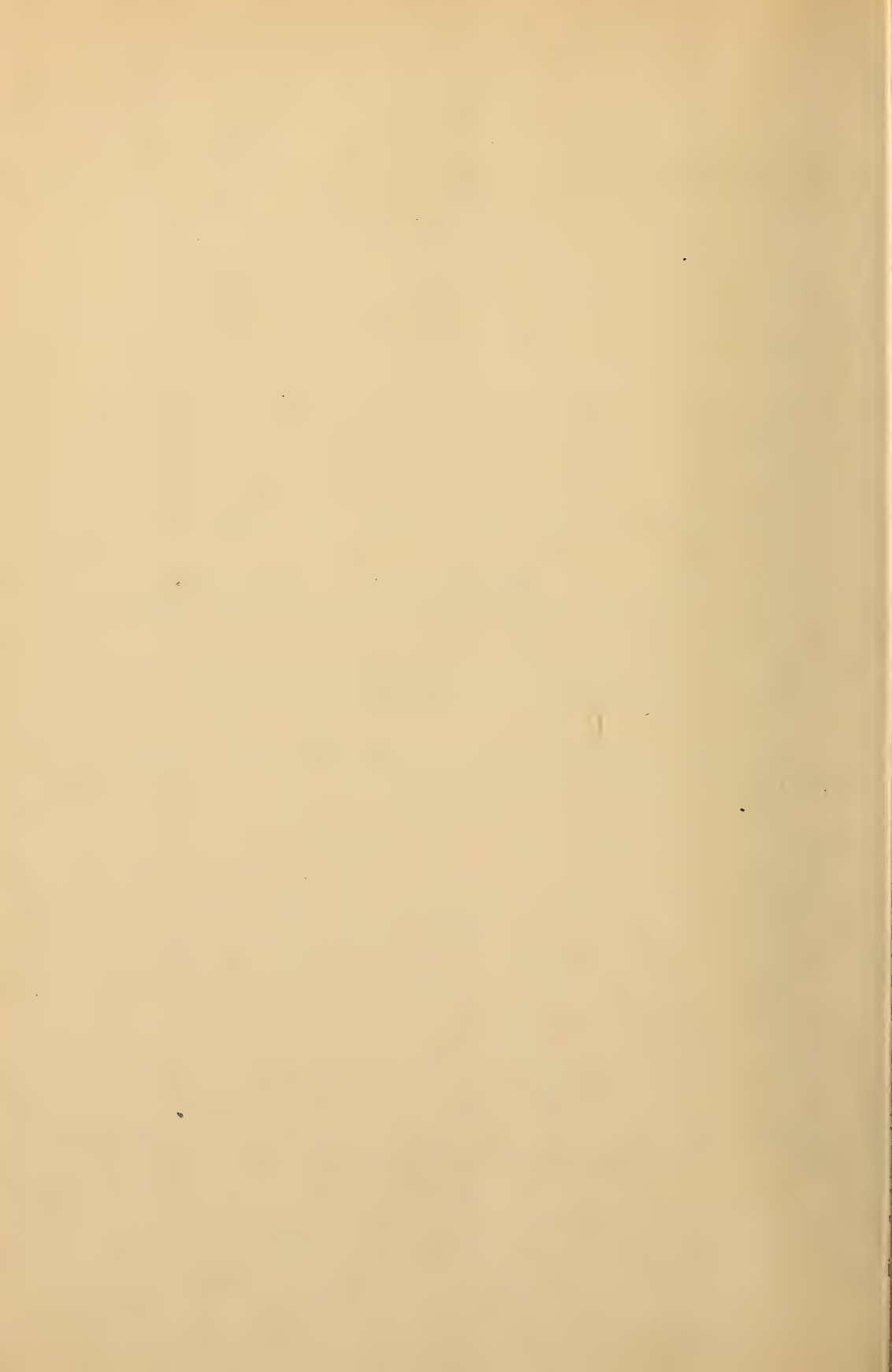
The connexion between the proposal to create a West Indian Court of Appeal, on the one hand, and the before-mentioned legislative reforms in British Guiana, on the other, is this: In appeals from British Guiana the Appeal Court would have to administer British Guiana law. Now, the common law of British Guiana was Roman-Dutch law. The only member of the Court of Appeal, however, who could be relied on to know Roman-Dutch law would be the Chief Justice of British Guiana (who could not sit in appeals from his own decisions), and (possibly) the "barrister judge" (if any) imported from outside. The result would be that, in the words of Mr. Nunan, the judges of the Appeal Court would have "to plunge into the study of a [to them] new system of jurisprudence for the benefit of litigants in British Guiana." And since (to quote the Report of the Common Law Commission, p. 21) "the serious study of the [Roman-Dutch] common law is a matter of years of patient labour. . . . the prospect of decisions on [that] law by West Indian judges based upon casual study for the purpose of trying isolated cases is not attractive." The conclusion drawn from this state of things was that such parts of the Roman-Dutch law as it was desired to preserve for the Colony should be embodied in an Ordinance, and the remainder abolished. This, as already explained, has now been done. Some doubt may, however, be expressed whether, even so, an Ordinance resting in fact on a basis of Roman-Dutch law can be satisfactorily handled and interpreted by a Court that makes no claim to have knowledge of that law.

¹ Appeals from the Colonies in question to the King in Council are not numerous. In the five years commencing in 1910 there were only five—three from Trinidad and Tobago, and two from British Guiana.



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